Regional Urban Development Office/South Asia
U.S. Agency for International Development

Urban Climate Change Strategy Recommendations for South Asia

An Integrated Approach to Address Cross-Cutting Urban Development and Environmental Challenges in the South Asia Region

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PLANNING AND DEVELOPMENT COLLABORATIVE INTERNATIONAL

Development Solutions for the 21st Century

Urban Climate Change Strategy Recommendations for South Asia

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Executive Summary

South Asia faces considerable urban development challenges with surging economic and population growth. National, state, and local governments in the region face unprecedented challenges to provide cities with basic water, sanitation, and waste management services, ever more electricity, alternatives to congested road transport, reduced pollution levels, and remedies for natural disasters.

At the same time, South Asia is expected to generate a growing share of greenhouse gas emissions—mostly from fossil fuels burned to produce electricity, or to power motor vehicles—that contribute to global climate change, a phenomenon that most experts expect to cause among the most profound impacts on populations, economic health, and environmental conditions the world has seen. Almost ironically, the countries in South Asia are also among most at greatest risks to the impacts of climate change, such as increased risk of floods, droughts, tropical storms, or rising sea levels.

The solutions to both the challenges of urbanization and climate change are often one and the same. Efforts to improve urban environmental management, service delivery, and infrastructure tend to improve efficiency in municipal systems, reduce costs, and mitigate the emissions that contribute to climate change. However, without a clear understanding of the cross-cutting linkages between urbanization, climate change, and other development challenges, many opportunities to address win-win opportunities may be missed. To be most effective in meeting multiple ecological, economic, and socially-oriented goals, urban development activities should deliberately incorporate climate change and other cross-cutting strategies as an integral part of project design and implementation.

RUDO/South Asia recognizes the numerous synergies that exist between urban development and cross-cutting environmental issues, particularly climate change. Thus, RUDO/South Asia seeks to exploit and incorporate these synergies as part of a regional urban climate change strategy. This strategy will be incorporated as a part of RUDO's existing strategic objectives, as well as those of the Agency's Climate Change Initiative. Under the strategy, RUDO/South Asia will play a leadership role in identifying opportunities for cross-cutting urban development approaches, coordinate with other divisions within USAID and with key partners in the region, and share lessons learned in addressing the complex and inter-related challenges of urbanization and climate change. RUDO/South Asia will take steps to ensure that its projects and programs go beyond traditional urban development approaches by incorporating such innovative, cross-cutting goals, strategies, and activities.

This document discusses the key climate change and urban development challenges for South Asian cities, the methodology for developing an urban climate change strategy, RUDO/South Asia's strategic approach for implementation, key activities to implement the strategy, and specific Agency results being advanced under the strategy.

I. Climate Change and Urban Development Challenges for South Asian Cities

Urbanization and climate change are two phenomena that will play major roles in shaping the global commons in the 21st century. As in many developing countries, cities in South Asia face unprecedented environmental pressures as a result of economic expansion and population growth, including traffic congestion, among the worst air and water quality, over-extraction of groundwater resources, inadequate sanitation and waste collection services, and related health and social problems.[1]

Climate Change and Cities

Global climate change poses profound risks to international economic development and ecological balance, and threatens to create significant burdens for cities and their populations, particularly those in South Asia. Global warming, the primary result of climate change, is caused by an increase in the concentration of greenhouse gases in the atmosphere, such as carbon dioxide, methane, nitrous oxide, sulfur dioxide, chlorofluorocarbons, and other gases. Since 1860, worldwide atmospheric concentrations of carbon dioxide, the most prevalent greenhouse gas, have increased by over 30 percent, from 280 to 366 parts per million.[2] During that same period, global temperature has increased by about 1 degree centigrade.[3]

A clear trend has emerged suggesting that increasing greenhouse gas emissions from human activities has resulted in an increase in global temperature. Scientific study of climate trends over the Northern Hemisphere for the last 1,000 years reveals that the 20th Century was the warmest century on record. Likewise, the 1990s saw five of the warmest years on record, with 1998 the warmest in recorded history. According to the most recent studies of the Intergovernmental Panel on Climate Change (IPCC), by 2100, when atmospheric carbon dioxide concentrations are expected to double, average global temperature will rise by an additional 2.7 to 11 degrees Fahrenheit.[4]

Greenhouse Gas Emissions from Cities. While urbanizing cities are expected to face numerous development challenges in the coming decades, urban areas are major contributors to greenhouse gas emissions worldwide. Covering just 2 percent of the Earth's surface, cities account for roughly 78 percent of the carbon emissions from human activities.[5] Motor vehicles, energy consumption, industrial activities, and open landfills are leading sources of greenhouse gases. Cities also add significantly to the growing strain on the biosphere's natural process of carbon sequestration. Urban demand for wood and other natural resources, primarily for use as fuel and construction materials, furthers destruction of forests and wetlands in many developing countries.[6]

Urban Vulnerability to Climate Impacts. In addition to contributing to the problem of climate change, many cities are also vulnerable to its effects—in-migration of environmental refugees, rising sea levels, and more frequent and intense storms. Changes in global mean temperature are expected to have varying effects on climate, including changes to precipitation patterns, increased risk from floods and winds, and increased frequency of hurricanes, tornadoes, and severe weather prompted by El Niño. Likewise, increasing temperatures has meant accelerated melting of glaciers and ice in polar regions. Urbanizing

[1] http://www.eapap.unep.org/apeo/Chp1i-urban.html

[2] *Climate Change Initiative 1998-2002*, U.S. Agency for International Development (1997), 9 (*hereinafter USAID Climate Change Initiative 1998-2002*). See also Lester Brown, *et al*, *Vital Signs 1999*, WorldWatch Institute (1999), 58.

[3] *Common Questions about Climate Change*, United Nations Environment Programme (undated), 7.

[4] Intergovernmental Panel on Climate Change, *Shanghai report* (need complete cite).

[5] Molly O'Meara, *Reinventing Cities for People and the Planet, WorldWatch Paper 147* (June 1999), 7.

[6] See http://www.eapap.unep.org/apeo/Chp1i-urban.html

cities in coastal areas—a population of about one billion—are particularly at risk from rising sea level and severe weather events.

The earth's sea level is expected to rise by between 15 and 95 centimeters by the year 2100.[7] In all, two thirds of the world's cities with populations of 2.5 million or more are near tidal estuaries.[8] Mumbai, Calcutta, Chennai, and Dhaka are among the major South Asian cities that are threatened by sea level rise and other severe climate impacts.[9]

Synergies in Addressing Climate Change and Urbanization in South Asia

While climate change is typically thought of as a global environmental problem, the technologies and practices used to address it can be highly effectively applied at the local level. Cities offer unlimited opportunities to address climate change while also addressing urban poverty, inadequate water supply, sanitation, waste management, and housing conditions, severe air pollution and traffic congestion. Addressing each of these challenges will also provide significant co-benefits in addressing climate change. Many of the same efforts to improve energy efficiency, increase reliability of service delivery, or support more sustainable transportation and land use planning, can also lead to significant reductions in greenhouse gas emissions. Likewise, efforts to improve urban response and preparedness to natural disasters, or to improve overall capacity of cities to cope with environmental stress and health concerns, coincide with international efforts to help cities in South Asia adapt to the growing threat of vulnerability to the impacts of climate change.

II. Methodology

This strategy was prepared as a result of extensive research and analysis of current and predicted urban and environmental trends in the South Asia region; consultations and interviews with numerous staff and officials at USAID, US-AEP, partner NGOs, private firms, other multilateral and bi-lateral donor agencies, and local communities; site visits in India and Bangladesh of RUDO/South Asia-sponsored activities; and integration of the insights and observations made at the USAID-sponsored conference on *Climate Change and Cities* held in Hyderabad, India in December 2000. The strategy also incorporates values and strategic objectives fundamental to RUDO/South Asia and related USAID divisions, and seeks to meet the broad objectives enunciated under the Agency-wide Climate Change Initiative.

III. Strategy to Address Urban Development and Climate Change in South Asian Cities

Vision

The Urban Climate Change Strategy for South Asia incorporates a vision for cities in South Asia to become increasingly self-sufficient to address the long-term risks of climate change while addressing many of the environmental and social pressures caused by urbanization, particularly for the urban poor. This includes a vision in which cities can develop awareness, technical and institutional capacity, and leadership to address climate change—through efforts that both mitigate greenhouse gas emissions from urban sources, such as the transportation sector, industries, and waste, and reduce cities' vulnerability to the threats of climate variability.

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[7] Secretariat of the United Nations Framework Convention on Climate Change, *Climate Change Information Sheet 11: Sea levels, oceans, and coastal areas* (January 1997). The "best estimate" for sea level rise over the next century is 50 cm. Global average sea level has already risen by 10 to 25 cm over the past 100 years. *Id.*

[8] *USAID Climate Change Initiative 1998-2002*, 18.

[9] Robert J. Nichols, *Coastal Megacities and Climate Change*, 37.3 GeoJournal 369-379 (1995).

Strategic Goals

Cities are sources of innovation, leadership, and practical know-how for local solutions. As the international community continues to take steps to address climate change, cities will play a decisive role in applying innovative technologies and practices that also meet objectives of increasing economic productivity, improving quality of life and social well-being, and conserving scarce resources. This strategy addresses the dual role of cities in responding to climate change—as sources of greenhouse gas emissions and as areas vulnerable to climate impacts.

Mitigating Greenhouse Gas Emissions. Many ongoing efforts to improve delivery of clean water, wastewater treatment, and solid waste management; improve transportation systems and traffic flow; reduce emissions from motor vehicle or urban industries; and improve construction and operation of municipal facilities and buildings can produce significant reductions in greenhouse gas emissions. Many South Asian cities can make progress toward this goal by implementing cost-cutting environmental measures that improve energy efficiency and industrial productivity, address local air pollution, support better urban services, reduce business expenses and municipal costs, improve housing and living conditions, and promote job creation. For example, significant cost savings can be achieved through energy efficiency applications both in municipal operations, industrial facilities, and buildings. Activities under the Strategy will identify key opportunities for applying these and other cross-cutting synergies, and introduce them where best suited to local conditions and needs.

Reducing Vulnerability and Promoting Adaptation. South Asia's coastal cities are among the world's most threatened by natural disasters and climate impacts. Continued and expanded efforts to prepare these cities for natural disasters will serve the long-term goal of responding to growing threats from floods, droughts, severe weather, and sea level rise as climate change impacts grow.

Key Action Areas

The following list provides a brief description of opportunities in specific sectors to address climate change and urbanization, with examples of targeted co-benefits and synergies. Several of these opportunities include overlapping efforts that can address both GHG emissions mitigation as well as climate vulnerability and adaptation at the same time. The table in Annex B provides a more detailed discussion of climate change and urbanization options.

It is important to note that the most significant opportunities to reduce GHG emissions come from reductions at the source, e.g., by reducing demand for and consumption of carbon-burning fossil fuels. These opportunities include: improved energy efficiency in water pumping, streetlights, buildings, or municipal facilities; fuel efficiency in motor vehicles; reduced waste generation and improved recycling; reduced dependence on fossil fuels, through improvements in transportation systems, mass transit, and land use change. Likewise, opportunities arise to capture the emissions themselves, such as through methane capture in landfills. On the other hand, efforts that simply work at improving local air quality do not necessarily also translate to reduced GHG emissions. For example, converting to electric vehicles may help alleviate local air pollution problems, but could still rely on electricity generated in carbon-burning, coal-fired power plants that release the same or greater levels of carbon dioxide per vehicle distance traveled. Compressed natural gas (CNG) will also improve local air quality, but, depending on the technology, will not necessarily lead to reduced carbon dioxide emissions. To derive the most benefit from new technologies, each must be considered in the broader context of their respective advantages and disadvantages in terms of urban environmental quality, urban service delivery, global climate change, economic and social impact, and a variety of other considerations.

- ***Drinking Water.*** Significant opportunities currently exist to improve the delivery of safe drinking water in South Asian cities, while reducing energy costs, mitigating greenhouse gas emissions, and

improving access to urban communities. A growing number of cities in South Asia reliant on aquifers for freshwater have been found to expend considerable revenue on inefficient and unreliable water pumping facilities. Heavy, inefficient withdrawals have also dropped water tables to record low levels. Recent efforts to upgrade water pumps in several cities, such as Ahmedabad, Pune, and Indore, have shown much promise for improving urban water delivery while responding to climate change. In many cases, simply addressing widespread leakage problems in water delivery systems can lead to considerable savings. Improvements to water pumping and distribution can also be valuable in reducing urban vulnerability to climate change, by strengthening cities' ability to adapt to climate events that jeopardize freshwater resources and water service delivery infrastructure.

- ***Wastewater Treatment.*** Wastewater and sanitation are among the most critical areas of urban service delivery in need of improvement, particularly for informal settlements. As with water supply, improvements to urban wastewater collection and treatment services can have climate benefits in term of both emissions mitigation and reduced vulnerability. Depending on the technologies applied, there are opportunities to recapture methane gas emissions produced as a by-product during the process of treating wastewater. This methane, which is 21 times more potent than carbon dioxide as a heat-trapping greenhouse gas, can also be reused or sold as fuel—often to displace high-carbon emitting coal-based energy sources. Moreover, improvements to wastewater and sanitation activities can help cities reduce health risks, many of which could be exacerbated during periods of increased impacts from climate change, such as increased flooding, droughts, or tropical storms.

- ***Solid Waste Management.*** Growing urban populations and economic activity in South Asian cities this century will add even greater burdens on municipal governments' ability to provide waste collection, management, and disposal services. Efforts to improve these services will have important benefits for climate change, particularly as a result of mitigated methane gas emissions from decomposing waste. Improved waste management and recycling can conserve resources while also reducing total methane emissions. Certain small-scale composting facilities and specially-designed sanitary landfills can also be operated to recapture methane gas that can be reused or resold. Demonstrations have already met with considerable success in Bangladesh and India. The reduced health risks resulting from improved municipal waste management, particularly for the poor, can also improve a city's ability to adapt to debilitating climate change impacts over the long term.

- ***Air Quality and Transportation.*** Improvements in urban transport systems and motor vehicles provide among the most significant opportunities for reducing both urban air pollution and greenhouse gas emissions. In fact, the United Nations Framework Convention on Climate Change (FCCC) itself recognizes the importance of supporting efforts to address climate change in developing countries where urban air pollution is particularly poor.[10] The greatest gains in GHG mitigation lie in actions that promote fuel efficiency, engine efficiency, mass transportation, integrated land use and transportation planning, and alternative fuels. For example, switching from two-stroke to four-stroke engines in two-wheelers and auto-rickshaws can produce remarkable reductions in air pollutants while improving efficiencies that cut carbon dioxide emissions and fuel costs. Promoting greater passenger ridership of buses—particularly compressed natural gas or electric buses—and light rail systems can also relieve increasingly congested roadways, reduce local

[10] Article 4, Part 8 of the FCCC provides:

> [T]he Parties shall give full consideration to what actions are necessary under the Convention… to meet the specific needs and concerns of developing country Parties… especially on… (f) Countries with areas of high urban atmospheric pollution…

United Nations Framework Convention on Climate Change, located on the web site of the FCCC Secretariat, http://www.unfccc.org/resource/conv/index.html.

air pollution, and limit carbon emissions. Cities also have unique opportunities to improve municipal fleets, including police, waste collection, or other vehicles. For example, municipalities can adopt policies or management practices that help improve fuel efficiency, promote alternative fuel vehicles, or avoid inappropriate uses (e.g., promote fuel savings for large operating vehicles by assigning them to heavy-duty tasks).

- ***Urban Land Use and Transportation Planning.*** Perhaps the greatest opportunity to increase mobility, improve urban air quality, and reduce GHG emissions would be through long-term strategic, integrated land use and transportation planning. A great body of knowledge exists in modern urban planning to help cities promote spatial development that provides, for example, a balanced combination of bus or trolley services, high-density housing along primary transportation corridors that branch out from the city center, improved access to mass transport by the urban poor, pedestrian spaces that relieve congestion, improving the proximity between residential and commercial areas, and other measures. Such comprehensive planning can reduce sprawl and over-dependence on motor vehicles as a primary source of transport while also reducing greenhouse gas emissions and major air pollutants.

- ***Municipal Operations and Streetlighting.*** As devolution of government authority continues in the South Asia region, municipal governments have increasing authority to determine how best to improve the technologies and practices used to operate their own facilities, such as streetlights, hospitals, schools, government buildings, and other facilities. New longer-lasting and highly energy efficient lighting technologies—which can be installed along streets or in government buildings—now offer cities far greater opportunity to cut costs, reduced demand on power plants, conserve energy, and reduce emissions from power stations. New innovations in energy-efficient air conditioning and heating technologies for buildings, weather-proofing, and window retrofits can also add to energy savings and lead to reduced greenhouse gas emissions.

- ***Housing and Buildings.*** Buildings can offer considerable gains in energy savings and emissions reduction both in their construction and their operation and use. In many informal settlements, for example, alternative cooking fuels or specially designed stoves can be used to reduce the need for wood-based fuels that deplete forest resources (which remove carbon form the atmosphere) and add to local air pollution and greenhouse gas emissions. In terms of urban vulnerability, buildings with improved weatherization and overall construction could also better handle the severe weather that is predicted to increase with climate change.

  As with other municipal facilities, buildings and housing units can be designed or upgraded to better withstand the demands of excessively hot or cool weather to reduce energy usage. Improved building materials and construction practices can also lead to significant reductions in greenhouse gas emissions. For example, buildings requiring cement—among the most energy intensive and greenhouse gas-emitting industrial products—can be constructed using reformulated or "recycled" cement, saving energy demand from cement manufacture while providing the same function as "new" cement. Use of other alternative construction materials, and innovative (or, in some cases, traditional) building design can likewise lead to significant improvements in the ability of a building to remain cool during warm seasons or warm in cooler seasons, again reducing energy-related costs and emissions, in addition to improving the overall indoor climate.

- ***Energy Supply and Reliability.*** Another approach to reducing energy consumption and associated environmental and economic problems, is to support improvements to energy systems and power reliability in South Asia, particularly in urban areas. In addition to disrupting other commercial activities, environmental and health services, and other urban systems, frequent blackouts have made urban populations highly dependent on backup systems, such as diesel generators, that often generate much worse local air pollutants and higher levels of GHG emissions than the off-line power plants.

Broad efforts to improve energy production and infrastructure will do much to improve other urban conditions.

- ***Disaster Planning and Preparedness.*** Natural disasters such as floods, droughts, and severe weather are likely to increase in frequency and severity as climate changes into the next century. Rising sea level is also expected to have profound impacts on coastal areas in Bangladesh, India, and Sri Lanka. Continued efforts in disaster planning, management, and preparedness will be critical for cities in South Asia to prepare for climate change, particularly highly populated coastal cities. These cities will need to take additional steps to understand their particular vulnerability to climate effects through new approaches in vulnerability assessment, modeling, and planning. Over time, cities should seek to proactively integrate disaster-related and vulnerability assessment and planning practices.

- ***Urban Environmental Planning and Management.*** Cities can take a number of steps to better plan urban development and manage city operations through a variety of planning tools. These tools include, for example: environmental risk assessment (ERA), environmental health risk assessment (EHRA), environmental mapping, environmental impact assessment (EIA) of development projects, and air and water quality monitoring. These tools can provide valuable insights into environmental and health conditions, development patterns, and the environmental and health risks to local communities—generating data and insights that can be utilized for more accurate and comprehensive plans for land use and transportation, waste management, water delivery, wastewater and sanitation, and waste collection, and contribute to city planning for natural disasters and long-term climate vulnerability. Moreover, these tools can support public participation—often directly involving community organizations and the public in local government efforts to conduct assessments, develop maps, or monitor environmental conditions. Activities that support tree-planting, protection of green spaces, and creation of "urban forests" will likewise help improve urban air quality, reduce energy consumption (through shading), protect urban wildlife, and improve overall quality of life—while also contributing to global efforts to preserve carbon-absorbing forest resources.

- ***Infrastructure Finance.*** Financing decisions can have tremendous impact on the nature and quality of urban development activities. As many municipalities, state governments, donor institutions, and private lending institutions increasingly include environmental considerations in their decision-making for project financing, new opportunities can be identified to also address climate change. Improving access to and management of financial resources, such as debt markets, can facilitate significant local investment in critical infrastructure and service delivery projects. In turn, investment actions may be completed in line with sound principles of environmental planning and resource conservation, and further the goals of sustainable urban development, as well as local and global environmental protection.

- ***Strengthening Participation, Capacity, and Awareness.*** As with many other development initiatives in South Asia, USAID and its partners should seek to strengthen efforts to strengthen public participation, awareness, and technical and institutional capacity that incorporate climate change as part of broad-based efforts to promote sustainable urban development. Climate change should not necessarily be a leading consideration when seeking to address development priorities at the local level. Indeed, climate change need not be considered as any more than an indirect benefit of efforts to address other city management priorities. Nevertheless, an improved understanding of the long-term impacts of climate change, as well as the co-benefits of taking a climate change *approach* in solving local problems, can help further efforts to improve service delivery, conserve energy and other resources, save costs to consumers and to government, and improve quality of life.

Providing Leadership

Addressing climate change in South Asia's urbanizing cities provides a valuable opportunity to demonstrate leadership in economic progress, global and local environmental protection, and support for the urban poor. A large number of internationally-funded projects and programs currently promote climate change mitigation and adaptation in developing countries. Another large number, including extensive ongoing activities of RUDO/South Asia, promote sustainable urban development. A small but growing number of these activities around the world address the concerns of global climate change and urbanization in the same context. Through this strategy, RUDO/South Asia seeks to take advantage of the numerous synergies that exist to address local environmental concerns while meeting the objectives of international commitments to address climate change. RUDO/South Asia hopes its efforts in cities in the South Asia region also contribute to ongoing USAID and other international efforts to foster a new way of thinking about finding local solutions to global problems—a level of awareness that will have much to offer in overcoming the ever-growing challenges facing developing country cities.

With a history of innovative and entrepreneurial support for urban development efforts in South Asia, RUDO/South Asia provides an important source of leadership for local, regional, and national governmental bodies and officials, non-governmental organizations, financial institutions and other private sector partners, universities and other academic institutions, and other international donor organizations. Likewise, the programs which RUDO/South Asia has developed and implements in the region provide critical leverage points for other USAID Global Bureau and bilateral (mission) programs, as well as other US government programs, such as the U.S.-Asia Environmental Partnership and the U.S. Environmental Protection Agency. RUDO/South Asia's ongoing efforts and institutional partnerships will continue to serve important roles in promoting sustainable development and be quite valuable in advancing new climate-friendly activities with South Asian cities.

The Role of Local Partners

Municipal governments have a key role in promoting sustainable solutions to local challenges caused by urbanization—and to implement new technologies and practices that address global climate change—particularly as decentralization of government authority continues in the region. Efforts to decentralize authority under the 74th Amendment to the Indian Constitution, for example, has given local authorities important new responsibilities and opportunities for action. Municipal governments and community-based institutions play a vital role as champions of local social, economic, and environmental concerns, and often have an intimate understanding of local priorities and opportunities to address urban development concerns. Likewise, municipal governments will play a critical part in helping national governments meet the objectives enunciated in the FCCC. Most activities under the Strategy will specifically promote collaboration among local governments and USAID partners—in identifying opportunities for improving urban environmental conditions and economic productivity, reducing greenhouse gas emissions, and lowering the risks of future climate impacts. This strategy recognizes the critical role local governments, partners, and communities play in improving urban management and the local environment. RUDO/South Asia will seek to work in particular with local governments, NGOs, and communities to find local solutions that meet urban development challenges while providing relief to the global environment.

Integration with the USAID Climate Change Initiative and Other Initiatives

The Global Climate Change Strategy for RUDO/South Asia will be an integral part of the USAID Climate Change Initiative, a $1 billion, 5-year program aimed at helping developing and transition countries to meet the underlying objectives of the United Nations Framework Convention on Climate Change (FCCC). Along with activities addressing forestry and land use, and developing country

participation in FCCC events, USAID's urban programs constitute a key contribution to the Agency's sector-specific activities providing technical solutions to climate change. The RUDO/South Asia Strategy will support the broader framework and objectives of the Climate Change Initiative, both in terms of meeting Agency targets for emissions mitigation and reduced vulnerability.

In addition to being an integral part of the Climate Change Initiative, the Urban Climate Change Strategy for South Asia supports objectives outlined in USAID's Making Cities Work Initiative. Launched in 1998 by the Administrator, Making Cities Work provides a central platform for coordinating and support efforts to address urbanization throughout the Agency. One goal of Making Cities Work is to increase opportunities for cities to mitigate environmental threats, including climate change. This Strategy helps "operationalize" the objectives of Making Cities Work with those of the Climate Change Initiative under a combined, cross-cutting set of programs and activities.

This Strategy likewise will serve to complement several other USAID initiatives, such as the South Asia Regional Initiative for Energy (SARI-E) as well as new joint efforts of USAID/India and G/ENV to develop a cross-cutting initiative highlighting the Energy-Water Nexus. This Strategy shares many of the same goals in terms of energy efficiency and improved service delivery for urban populations.

Addressing Climate Change through Existing Strategic Objectives and Results

This Strategy will operate within RUDO/South Asia's and G/ENV's existing results framework to improve the management of urbanization in targeted areas, and seek to complement ongoing efforts under the strategic objectives and results of the USAID Climate Change Initiative; environment and energy programs in USAID Missions for India, Bangladesh, Sri Lanka, and Nepal; the South Asia Regional Initiative for Energy (SARI-E); and the U.S. Asia Environmental Partnership (US-AEP).

Many of the strategic objectives and targeted results of these offices and programs active in South Asia are highly complementary to those of RUDO/South Asia and to the goals of this strategy to promote "win-win" solutions to both climate change and urban development challenges in the region. Key objectives and results address:

- Improved urban service delivery, infrastructure, and shelter;
- Strengthened local government capacity and municipal environmental management;
- Reduced urban air and water pollution;
- Reduced industrial emissions and improved industrial efficiency;
- Mitigation of greenhouse gas emissions from urban sources; and
- Reduced vulnerability of cities to the effects of climate change and natural disasters.

Annex D provides a detailed list of the strategic objectives and results of RUDO/South Asia and key USAID bi-lateral and regional urban, environmental, and energy programs in South Asia.

Regional Urban Development Objectives and Climate Change. The RUDO/South Asia's existing strategic framework complement the Agency's Climate Change Initiative on several fronts. RUDO/South Asia's objective of *Expanded and Equitable Delivery of Urban Environmental Services and Shelter* supports global climate change objectives by promoting more efficient, cost-effective, and reliable delivery of municipal services that save energy while reducing greenhouse gas emissions. Improved service delivery likewise helps reduce the vulnerability of cities to long-term climate effects. The objective of *More Effective Local Governments* complements efforts to improve local capacity to develop

and manage local climate change planning and monitoring activities, adopt efficient urban environmental management tools, adjust local government regulatory, policy, and financial systems to promote climate change goals, and increase public awareness about climate-friendly programs, initiatives, and practices. Likewise, the cross-cutting objective of *Reduced Urban Pollution* has supported efforts to improve urban environmental quality through climate-friendly approaches to urban development, such as environmental management systems, methane gas recovery from municipal operations, and sustainable transportation.

IV. Implementation

Strategy implementation will be a team effort drawing on technical expertise and resources from RUDO/South Asia, and coordinating with ongoing USAID bi-lateral environment and energy programs in India, Bangladesh, Sri Lanka, and Nepal, the USAID Global Environment Center and Climate Change Initiative, the Bureau for Asia and the Near East (ANE), and the U.S.-Asia Environmental Partnership (US-AEP). As with all of its programs, RUDO/South Asia will seek to facilitate information exchange and common understanding of the benefits of adopting an integrated approach to project implementation that addresses climate change and related cross-cutting environmental concerns.

Strategic Approach

In implementing and "operationalizing" this strategy, RUDO/South Asia will seek to evaluate each of its new and ongoing programs and activities to identify and integrate new opportunities to promote synergies among traditional urban development and environment actions, and with measures that respond more broadly to global climate change and other cross-sectoral concerns. While many of RUDO/South Asia's activities and objectives to promote sustainable urban development will remain essentially unchanged, the added understanding and inclusion of climate change and other cross-sectoral responses will help to illuminate new opportunities for program efficiency, resource conservation, broadened awareness among RUDO partners and stakeholders on integrated solutions to common development/environment problems, and lend support to other global environment objectives of the Agency.

RUDO/South Asia's strategy seeks to incorporate climate change and related cross-sectoral considerations into its ongoing efforts to improve municipal infrastructure and services, shelter, urban planning, and disaster planning and preparedness. Climate change and related issues will become an important aspect in terms of program interventions such as:

- strengthening local governance and environmental management capabilities;
- building capacity and increase awareness in local governments, institutions, and NGOs;
- promoting mechanisms that mobilize financial and investment resources for development and management of urban environmental infrastructure through public-private partnerships;
- support for community-based self-help initiatives that improve urban environmental conditions;
- supporting information dissemination; and
- improving the policy environment for sustainable urban development.

As appropriate, RUDO/South Asia will seek to consider global climate change and related global and cross-sectoral environmental concerns as part of its Performance Monitoring Plan, and as key components of its strategic objectives, results, and performance indicators. Likewise, by adopting this strategy, RUDO/South Asia seeks to support the objectives of the Agency's five-year Climate Change Initiative.

Leveraging RUDO/South Asia Relationships with Local Governments, Bilateral and Multilateral Donors, and Partners

This strategy introduces a pioneering effort to consider cross-cutting opportunities to address synergies in urban development, such as climate change. In order to maximize the benefits of this approach, RUDO/South Asia will seek to share information with other donors, partners, and governmental bodies about its initiatives to integrate climate change into ongoing urban development activities, and to seek input as well as information about partners' related or complementary efforts. Sharing information, experience, and lessons learned among partners are each essential for effective planning and cooperative and complementary development initiatives. For example, the World Bank, Asian Development Bank (ADB), and other donors working in the region are currently undertaking a number of significant urban development projects throughout the South Asia region aimed at improving infrastructure, financing, and local capacity to provide basic services and improve living conditions, primarily for the urban poor. The British Department for International Development (DFID)'s Urban Poverty Reduction Strategy makes urban service delivery and improved municipal management among the top priorities for addressing urban poverty.

Management and Coordination

RUDO/South Asia will manage the implementation of this strategy through continued collaboration and coordination with USAID bi-lateral programs in India, Bangladesh, Nepal, and Sri Lanka, regional programs such as the U.S.-Asia Environmental Partnership (US-AEP) and the South Asia Regional Initiative for Energy (SARI-E), and programs initiated in the Global Environment Center (G/ENV) in AID/W. RUDO/South Asia will also seek to coordinate with other key USG activities, such as those of USEPA. Specific activities and opportunities for coordination are discussed in the sections below.

Mechanisms

The principal contract mechanisms of RUDO/South Asia to implement this strategy and related activities will include the Indo-US Financial Institutions Reform and Expansion Program (Debt Market Development) (FIRE(D)), the Sustainable Urban Management Indefinite Quantity Contract (SUM IQC), and grants provided by RUDO/South Asia on a case-by-case basis.

V. RUDO/South Asia Climate Change Activities

The following provides a brief discussion of ongoing RUDO/South Asia and related urban development programs with key options for climate change and other cross-sectoral interventions.

Integrated Urban and Climate Change RUDO Activities

Indo-US Financial Institutions and Reform and Expansion Program (Debt Market Development) (FIRE(D)). FIRE(D) supports the urban development by introducing improved municipal management tools that build local government urban management capacity; establishing mechanisms that increase access to financial and investment resources and improve management capabilities for municipal environmental infrastructure; and supporting NGOs in community-based information and awareness campaigns and local initiative.

Partners under FIRE(D) include USAID, the Government of India Ministry of Urban Development, the Housing and Urban Development Corporation (HUDCO), Infrastructure Leasing and Financial Services, Ltd. (ILFS), and the National Institute of Urban Affairs (NIUA). FIRE(D) has already had considerable success in supporting local-level reforms in financial management and practices, and opened numerous

opportunities for strategic support and investment in much-needed municipal infrastructure and services, local capacity, and increased awareness on urban environmental concerns. These activities have included targeted efforts that improve water supply and sanitation services, sewage treatment, solid waste management, waste-to-energy applications (methane capture), increased energy efficiency in municipal operations, as well as more comprehensive structural improvements to municipal and state-level financing and policy reforms that promote infrastructure development.

As FIRE(D) continues in its second phase, additional attention will be given to the important opportunities and synergies that exist between local environmental management and services needs and climate change and related cross-sectoral concerns. The FIRE(D) program and its partners will have unique opportunities to introduce technical and managerial approaches that promote energy-savings, resource conservation, and emissions reductions in a wide range of municipal operations. One complementary new effort under FIRE(D) will be to help leverage financial resources through the Development Credit Authority (DCA). This may be particularly relevant as most projects meeting DCA's criteria for financially viability and cost recovery often also have important climate change benefits. Extra effort will be required, however, to ensure that newly proposed DCA activities are designed to meet multiple objectives that include climate change.

Urban Environment Management Tool Kits. Supported through FIRE(D), this effort seeks to introduce environmental planning and management tools with a range of practical applications for local governments and communities. RUDO/South Asia's work on Urban Environmental Management Tool Kits includes: development and application of urban environmental mapping; environmental/health risk assessments; environmental workbooks; environmental management action plans; and support for public participation that leads to improved urban management and support for commercially-viable practices. Initiatives to develop environmental workbooks has led communities and local governments to greater awareness of local problems and risks, and to increased recognition that accurate information is essential for making the most informed and strategic decisions in facing growing challenges while using limited resources. RUDO/South Asia's environmental management activities has been introduced in India, Bangladesh, Sri Lanka, and Nepal.

The environmental workbooks, maps, and risk assessment provides cities and communities with more accurate information for managing complex urban infrastructure and service demands, which in turn improve service efficiency and can promote long-term benefits in reduce greenhouse gas emissions. The environmental workbooks prepared for Madhyapur-Thimi and Kirtipur municipalities in Nepal, for example, (as any other tool kit activity initiated in other cities) could be used to identify more effective ways to address greenhouse gas emissions. Likewise, any effort to date that has considered and addressed urban sprawl—that reduces driving distances and dependence on vehicle transport, for instance—could have long-term benefits in reducing overall motor vehicle dependence in cities in the region, and reduce overall emissions.

More immediately, these city-based assessment tools can be applied when considering the impacts of climate change and related natural disasters, as well as secondary health risks, particularly in cities along coastal zones where weather-related impacts such as floods and tropical storms have ravaged local populations. Sea level rise is also expected to pose significant risks to coastal areas in Bangladesh, India, and Sri Lanka. According to a recent study by TERI, highly populated coastal cities, such as Mumbai or Chennai, were at greatest risk from sea level rise. To date, RUDO's work include environmental status reports for Maharashtra, City Corporate Plans in Tamil Nadu, environmental risk assessments in Khulna, Gopalganj, and Mongla, Bangladesh, and a Risk Management Action Plan for Khulna. Each of these management tools could provide the basis for more detailed studies of longer-term risks of climate change impacts, and adaptation programs to respond to such risks, either through RUDO or other USAID-funded work (such as the G/ENV-funded vulnerability assessment) or through other partners.

Urban Environmental Infrastructure Advisory Services, India. In collaboration with the US-Asia Environmental Partnership (US-AEP), RUDO/New Delhi has procured the services of an Urban Environmental Infrastructure Representative (UEIR) to work directly with municipal governments, private sector sponsors, and NGOs throughout India to provide technology consultation, trainings, and project advisory services on municipal infrastructure projects, primarily relating to solid waste management and treatment. Results of this activity have included preparation of a series of solid waste management reports and strategic plans for improved waste management, and will include preparation of a national manual on waste management.

To address the linkages between waste management and climate change, ongoing efforts to develop reports, guidelines, strategies, or manuals, or to conduct workshops and trainings, could incorporate more open discussion of waste management practices that reduce methane gas emissions from the waste collection and disposal cycle, and seek to provide cities with a clearer understand of management options that reduce emissions. Recaptured methane gas can be used as an alternate to more carbon-emitting fossil fuels.

NGO Small Grants Program. RUDO/South Asia provides targeted supports through its small grants program to a number of NGOs in the region implementing community-based campaigns to improve environmental services, primarily in solid waste management and sanitation. EXNORA, an NGO based in Chennai, has recently conducted a number of community-level waste collection and disposal activities, working with local unsettled "ragpickers" to help provide them with community structure, a source of income, and, over time, increasing number of land rights. RUDO/South Asia has supported similar work with EXNORA in Kerala and Pondicherry, and related community-based waste collection and composting with NGOs such as the Indian Environmental Society in Agra, Waste Concern in Dhaka and elsewhere in Bangladesh, and Conserve in New Delhi. In terms of climate change, these programs can continue to help improve waste collection and disposal practices to minimize methane emissions from open dumps, and to reduce the incidence of diseases caused by poor waste management and sanitation, and which maybe exacerbated by climate change.

Recognizing the numerous climate change and related health and environmental benefits of these activities, RUDO/South Asia will seek to facilitate coordination between these NGOs and ICLEI under the Cities for Climate Protection activity in India, as well as other USAID partners active in community-based urban management activities.

Promotion of Private Infrastructure Project (PPI), Sri Lanka. In cooperation with USAID/Sri Lanka, RUDO/South Asia has initiated the PPI to assist the Government of Sri Lanka to modernize its infrastructure, develop a market for private financing and infrastructure management, and increase the quality and competitiveness of municipal services. Through BOO and BOT activities, PPI will support private sector participation in developing new infrastructure primarily water supply, sanitation, and solid waste management.

In considering the climate change implications for this activity, RUDO/South Asia should promote recognition of the emissions reductions from infrastructure development efforts, and should seek to raise awareness of climate change benefits as part of infrastructure planning decision-making. Side-benefits of reducing greenhouse gas emissions through the Pahala Karawita waste management project, for example, should be recognized as part of project planning as well as overall outcomes. Likewise, improvements to water supply and sanitation under the Welhena/Serupita Scheme, for example, can be viewed as providing long-term benefits to risks of weather-related climate impacts.

Coordination with Other USAID Programs

USAID/India - Office of Environment, Energy, and Enterprise (E3). USAID/India's E3 Office is working with Indian industry through five model greenhouse gas emissions reduction projects. RUDO/South Asia plans to work closely with E3 in each of the following project areas on an as-needed bases, and to coordinate in specific areas that overlap and complement ongoing RUDO activities, such as FIRE(D), with specific urban development and climate change benefits.

- ***Greenhouse Gas Pollution Prevention Project (GEP).*** An additional $20 million was recently approved under the this project to support urban and transport climate change projects and development technologies that reduce greenhouse gases. Under GEP, work has continued to promote clean technologies, supply-side energy efficiency, environmental management systems (EMS), and outreach to a broader base of climate change stakeholders. Another centerpiece activity of GEP has been fostering a dialogue with the Mumbai Municipal Corporation and local bus companies to introduce CNG into its fleet, and to introduce transportation planning measures that will reduce overall greenhouse gas emissions. E3 has also recently worked to develop a best practices handbook on biomass co-generation, an effort that could have significant contributions to alternative energy efforts in Indian cities.

- ***Energy Management Consultation And Training Program (EMCAT).*** Under one component of this omnibus energy program, E3 is collaborating with G/ENV's IZET to introduce electric vehicles in Indian cities that could replace highly polluting two-stroke engines in 2-wheelers scooters and 3-wheeler rickshaws. Other activities have include support for introducing energy efficient lighting in Ahmedabad. EMCAT will also serve as the program base through which E3 will support USAID's energy-water initiative for India.

- ***Clean Technology Initiative (CTI) for Industry.*** Among E3's air quality improvement activities, the CTI project has introduced automobile inspection and maintenance (I&M), air quality index development, and pollution monitoring and mapping to Indian cities. These efforts contribute significantly to improvements in air quality and fuel efficiency by identifying problems vehicle-by-vehicle, and by empowering drivers with basic knowledge about operation and maintenance. In terms of climate change, greenhouse gas emissions are reduced most effectively by improving vehicular fuel efficiency, as a result of reducing overall fuel consumption. In collaboration with RUDO/South Asia and other USAID offices, E3 has supported a series of two-wheeler I&M clinics in Delhi and Mumbai. USAID will continue to look to these activities as an important approach in reducing carbon dioxide emissions, as well as other local pollutants, in the urban context.

- ***Energy Conservation and Commercialization (ECO).*** This $25 million activity aims to reduce GHG emissions by creating a policy and market environment in India for more efficient energy production and use.

- ***Sustainable Cities Initiative (SCI) / Municipal Water Efficiency Program.*** In cooperation with the Alliance to Save Energy, USAID is supporting energy efficiency and improved environmental management measures in Chennai, Pune, and Indore, based largely on considerable successes from previous efforts in Ahmedabad where the municipal corporation saved an estimated $300,000 in energy costs and avoided 4,650 tons of carbon dioxide emissions. Activities include initiating a demand-side management pilot project and a water pumping efficiency project, as well as building capacity in local governments, NGOs, and energy service companies (ESCOs) in India. Additional work includes efforts to promote more energy-efficient streetlighting in these cities.

Development Credit Authority (DCA). As mentioned above, DCA provides a valuable credit mechanism that can leverage considerable financial and investment resources for urban development

projects, particularly valuable to South Asian cities where financial resources are quite scarce. DCA-supported activities tend to have considerable climate change and other environmental benefits; in fact, a specific objective of the USAID Climate Change Initiative is to leverage $250 million in DCA-funded projects for climate change activities. RUDO/South Asia has recently initiated efforts to apply DCA resources to infrastructure projects in India, and plans to take steps to raise awareness among other USAID staff and partners about the opportunities for utilizing DCA for urban development activities, many of which have considerable climate change benefits while working, for example, to improve urban environmental management, energy efficiency, and service delivery.

Global Environment Center (G/ENV) Programs. RUDO/South Asia is working in cooperation with the Global Environment Center on several activities designed to address climate change at the local level in India and the South Asia region. These include:

- ***Climate Change and Cities Conference, Hyderabad, India (December 8-9, 2000).*** Funded by G/ENV/EET, RUDO/South Asia, and US-AEP, this conference brought together individuals and technical experts from across India representing municipal corporations, NGOs, community-based organizations, donor institutions, the private sector, the press, and the U.S. Government to discuss the importance and benefits of addressing climate change as part of urban development strategies. Hailed as a landmark success, this workshop presented an entry point for inviting cities to join USAID's Cities form Climate Protection India program (see below) and related activities, supported by RUDO/South Asia, other USAID programs, and others, that will find opportunities to address global climate change through strategic urban development efforts that reduce both greenhouse gas emissions and vulnerability to climate impacts.

- ***Cities for Climate Protection (ICLEI), India.*** Jointly funded by G/ENV/EET, RUDO/South Asia, US-AEP, this project will introduce the world-wide Cities for Climate Protection program of the International Council for Local Environmental Initiatives (ICLEI) to India for the first time. Working in five or six cities representing each region in India, ICLEI works directly with local governments to solve local urban environmental challenges using approaches and technologies that have direct climate change benefits. The program takes city governments through the process of identifying and inventorying greenhouse gas sources and establishing targets for emissions reductions, helps cities seek out local partners to participate in implementation, and develops on-the-ground projects that demonstrate technologies and methodologies for improving the local environment while reducing emissions. RUDO/South Asia will make every effort to facilitate this project, as well as disseminate and replicate lessons learned throughout the region, as well as to other regions through the RUDO network.

- ***Urban Vulnerability Assessment and Toolkit, India.*** RUDO/South Asia seeks to support this G/ENV/EET-funded project to conduct an assessment of climate change vulnerability in an Indian city, and develop a toolkit that can be applied through replication in other cities throughout the region. The project will be implemented starting in 2001 with the assistance of the Oak Ridge National Laboratory. To the extent possible, RUDO/South Asia will seek to facilitate access to the products, outcomes, and lessons learned from Urban Environmental Management Toolkit projects from throughout the region, as well as lessons learned under regional AUDMP activities.

- ***Energy-Water Nexus Initiative, India.*** Funded through the G/ENV Water Team and USAID/India, this proposed activity seeks to address the two-fold problem of water supply and energy consumption in Indian cities, industries, and the agricultural sector. Financially-strapped municipal corporations in India spend as much as 60 to 70 percent of their entire revenue on pumping water, using significantly inefficient, outmoded technologies that often do not deliver water on a reliable basis. Improved technologies can reduce emissions while improving city services. Working with G/ENV/EET, other USAID/India staff, and RUDO partners, RUDO/South Asia plan to provide important input on this

initiative in identifying appropriate cities to work in, as well as technologies, infrastructure adjustments, and management approaches to improving water supply and reducing energy costs.

- ***India Zero Emissions Transportation Project (IZET).*** Jointly funded by G/ENV/EET and USAID/India, RUDO/South Asia has provided assistance in designing and implementing this activity to introduce electric vehicles in Indian cities. Such vehicles reduce local air emissions and can lead to overall net reductions in greenhouse gas emissions, depending on the source of electricity. As activities continue under this project, RUDO/South Asia will continue to offer technical expertise and input to G/ENV, USAID/India, private sector partners, and local governments on an as-needed basis.

USAID Support for the Asian Urban Disaster Mitigation Program (AUDMP). With support from the USAID Office of Foreign Disaster Assistance (OFDA) and RUDO/South Asia, the Asian Disaster Preparedness Center (ADPC) has implemented disaster preparedness and management activities throughout the region that relate closely with efforts to address climate change vulnerability. Implemented by ADPC, the AUDMP provides region-wide support in improving indigenous disaster preparedness, mitigation, and response capabilities. The South Asia region faces some of the world's most serious risks to climate impacts over the next century. Several current ADUMP activities relate to climate vulnerability in the region. For example, the Sri Lanka Multi-Hazard Mitigation Project (SLUMDMP) works in the City of Ratnapura to address the numerous risks to cities of landslides, frequent flooding, erosion, pollution and contamination of water supplies, and subsistence. The objectives of this project are to demonstrate a methodology for identifying disaster risk and conducting damage assessment, select appropriate mitigation strategies, and support local authorities with tools and skills to plan and manage for disasters. Efforts are underway to replicate the Ratnapura experience in the cities of Kandy and Mawalapitya. Similar efforts under the AUDMP's CARE/Bangladesh Urban Disaster Mitigation Project (BUDMP), funded by USAID's Office of Foreign Disaster Assistance. This project aims to reduce the vulnerability in two highly flood-prone cities, Tongi and Gaibandha, through increased technical and managerial capacity, as well as non-structural and minor structural community-based measures, that mitigate flood impacts. Mitigation and disaster preparedness measures adopted in these cities will be replicated to other municipal areas in Bangladesh.

Such disaster mitigation efforts will be important starting points to begin to address the growing risks from climate change cities in Bangladesh, Sri Lanka, and India expect to face over the long term. RUDO/South Asia is in an important position to help facilitate coordination on new initiatives to assess and respond to climate vulnerability region-wide, including the Vulnerability assessment project being funded through G/ENV (see below).

South Asia Regional Initiative for Energy (SARI-E). Recently launched by USAID/W and regional Missions, and headquartered in New Delhi, SARI will bring together regional energy sector players to share experiences and cooperate on energy reform and trade, facilitating a long-term process of rationalizing energy supply and its regional distribution.

US-Asia Environmental Partnership (US-AEP), India. Funded and operated jointly by USAID and the Department of Commerce, US-AEP is implementing a wide variety of environmental technology and trade-related activities in the South Asia region that seek to improve urban environmental management while providing a number of climate change and related benefits. In addition to its activities in policy reform, industry, and trade, US-AEP provides considerable supports towards urban environmental objectives, many of which are being implemented in partnership with RUDO/South Asia. These activities address urban water supply, wastewater and sanitation, solid waste management, air quality, urban buildings and their management, and local governance. US-AEP funded the *Climate Change and Cities* conference held in December 2000 in Hyderabad, and is currently undertaking an effort to develop a Country Urban Strategic Plan for India that will incorporate a number of activities with climate change

and related cross-cutting benefits. A complete list of US-AEP's current and ongoing activities relating to urban environment and development are included in Annex E.

Coordination with Other US Government Agencies

US Environmental Protection Agency (USEPA). USEPA has a number of USAID-funded activities underway or proposed that address urban development and environment concerns and contribute to greenhouse gas emissions reductions. RUDO/South Asia will seek to remain engaged with USEPA, USAID, and its partners in implementing these activities, primarily as they relate to ongoing RUDO and partner activities.

- ***Assistance on Vehicle Emissions Reduction Policy and Green Fleets Pilot Project.*** This program seeks to help Indian cities manage vehicle emissions pollution, through improved inspection and maintenance, fuel strategies, fuel quality, and vehicle standards. USEPA also plans to launch a "green fleets" program whereby private Indian and multinational companies would work on a voluntary basis to improve environmental performance of municipal vehicles of a major Indian city. Proposed partners include the Society of Indian Automobile Manufacturers and the Confederation of Indian Industries (CII).

- ***Environmental Technology Verification Program.*** Under this activity, USEPA will seek to explore mechanisms to improve India's access to technology verification for drinking water systems, pollution monitoring systems, and greenhouse gas reduction technologies.

- ***Estimating Environmental and Human Health Benefits of Greenhouse Gas Reduction (proposed).*** Under this activity, USEPA and USAID would collaborate with Indian institutions to measure human health benefits of greenhouse gas mitigation measures and propose action to Indian policy makers for emissions reductions. This work stems from widespread experience in dramatically reducing health-related costs by making small, targeted investments in pollution control.

- ***Particulate Matter Source Attribution Study for New Delhi (pending funding).*** To complement ongoing World Bank activities to improve air pollution monitoring in Indian cities, USEPA plans to develop new mobile monitoring stations to measure air quality and "finger-print" the sources of those emissions. New data could then be used to establish more permanent monitoring facilities.

- ***Partnership Program for Environmental Strategic Planning and Regulatory Implementation.*** Activities under this policy support program include: (1) feasibility assessment of a national emissions trading program; (2) information dissemination on improved industrial environmental performance; (3) a train-the-trainer activity in environmental compliance and enforcement; (4) a strategic planning/regulatory implementation pilot project; (5) institutional and regulatory reforms in environmental law.

VI. Results

Measuring results through established targets and performance indicators will be a fundamental component of implementing the Urban Climate Change Strategy. As part of its current results reporting approach, RUDO/South Asia will seek to utilize existing performance measures under the G/ENV/UP results framework, as well as USAID Climate Change Initiative and USAID/India results frameworks, to provide information about practical progress made in the urban context to address climate change and related cross-cutting environmental concerns.

RUDO/South Asia will continue to report on its efforts to promote expanded and equitable delivery of urban environmental services and shelter (G/ENV Result 2.1) and more effective local governments

(G/ENV Result 2.2). RUDO/South Asia will also provide relevant data on progress made under results for USAID/India (E3 Office), primarily including: carbon dioxide equivalents of greenhouse gas emissions avoided (Result 4.1) and improved urban environmental infrastructure built and services delivered in selected cities (Result 4.3). Likewise, reporting through the E3 Office, RUDO/South Asia will provide relevant reporting information to G/ENV under the Climate Change Initiative, primarily relating to capacity building and policy interventions supporting reduced net greenhouse gas emissions from the energy sector, industry and urban areas (Result 3) and activities promoting reduced vulnerability to the threats posed by climate change (Result 4).

VII. Adoption

This Urban Climate Change Strategy is proposed to be adopted by RUDO/South Asia as a core component of its overall strategic framework. Following its adoption, it will serve as a guidance or reference document for RUDO/South Asia's implementation of its ongoing programs in ways that seek opportunities to address climate change as part of existing urban environment and development priorities. Similarly, this strategy will be used to promote outreach about USAID's efforts to integrate climate change into its programs in the South Asia region and to facilitate coordination on related programs of other USAID missions and offices, other USG programs, partners, donors, and governmental bodies in the region.

Annex A: "Win-Win" Urban Development, Environmental, and Climate Change Opportunities for South Asian Cities

Drinking Water

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Energy Efficient Water Pumps	▪ Energy cost savings to municipal corporation ▪ New pumps can deliver water more reliably and with fewer interruptions	▪ Delivery improvements lead to reduced CO_2 emissions from reduced fuel use	▪ More reliable delivery helps cities adapt to climate impacts (i.e., reduced water supply) ▪ More reliable delivery reduces dependence on unsanitary water sources ▪ General improvements to infrastructure -related adaptation	▪ Considerable opportunities exist in most South Asian cities. Water shortages are already widespread, and will worsen as precipitation patterns are affected by climate change.	High
Improved Water Delivery/ Infrastructure	▪ Energy cost savings ▪ More reliable delivery ▪ Aquifer water can be conserved more effectively				High
Reduce Leakage from Delivery Systems	▪ Helps ensure reliable delivery of an increasingly scarce resource ▪ Reduces costs to municipal corporations				High

Wastewater & Sanitation

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Methane Gas Capture From Wastewater Treatment Plants	▪ Methane can be resold or used in co-generation	▪ Reduced methane emissions	*Not Applicable*	▪ Certain small-scale operations are more ideal for methane capture technology.	TBD
More Energy Efficient Wastewater Treatment Facilities	▪ Energy cost savings	▪ Reduced CO_2 emissions form reduced fuel use	▪ General improvements to infrastructure -related adaptation	▪ TBD	TBD
Improved Overall Wastewater & Sanitation Management And Infrastructure	▪ Improvements to health and sanitation and overall quality of life	*Not Applicable*	▪ Can prevent movement of water-borne and vector-borne diseases	▪ Broad benefits in addressing urban development and environmental goals	TBD

Solid Waste Management

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Methane Gas Capture From Sanitary Landfills	▪ Methane can be resold or used in co-generation	▪ Reduced methane emissions	*Not Applicable*	▪ Limited applicability to landfills in India, due to new waste management guidelines. Smaller-scale operations may be more appropriate. ▪ Great opportunities in Bangladesh, Sri Lanka, Nepal	India: Low Bangladesh, Sri Lanka, Nepal: High
Composting And Recycling	▪ Reduced cost for solid waste management ▪ Opportunity to resell fertilizer or reuse recycled materials	▪ Methane emissions avoided from decomposing waste ▪ Other GHG emissions avoided during processing	▪ General improvements to human health due to reduced risk of disease from poorly managed, contaminated waste	▪ Composting and recycling is already widely used in most South Asian cities	Low-Medium
More Energy Efficient Waste Treatment Facilities	▪ Energy cost savings	▪ Reduced CO_2 emissions form reduced fuel use	▪ General improvements to infrastructure -related adaptation	▪ TBD	TBD
Improved Overall Solid Waste Management And Infrastructure	▪ Improvements to health, sanitation, and overall quality of life	*Not Applicable*	▪ Can prevent movement of water-borne (through leaching) and vector-borne diseases	▪ Various health-related issues can be considered in cities throughout South Asia	TBD
More Energy Efficient Transport of Solid Waste	▪ Improvements in waste transport (e.g., through use of more appropriately sized trucks, improvements in delivery scheduling, or improved fleets) can help reduce fuel costs to municipal corporations and simplify transport logistics	▪ Improved scheduling, vehicle fuel efficiency, or transport-related logistical coordination can lead to efficiency gains that reduce CO_2 emissions	▪ General improvements to infrastructure-related adaptation	▪ TBD	TBD

Urban Forestry

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Tree Planting and Reforestation	▪ Shading helps cool buildings and lowers overall city temperatures ▪ Contributes to city beautification, overall	▪ Reduced energy demands relating to air conditioning in buildings ▪ Contributes to overall carbon	▪ Improves urban resistance to floods ▪ Helps sustain biodiversity vulnerable to climate change	▪ Many cities in South Asia already contain significant numbers of trees, but urban forestry could still make a	Medium

	improvements to quality of life	sequestration ▪ Certain tree species help reduce ambient air pollution		significant contribution to energy conservation, pollution control, and forestry efforts	

Transport

	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Transportation Planning	▪ Reduced congestion ▪ Reduced ambient air pollution ▪ Improved economic productivity through improved transport efficiency ▪ Increased safety for pedestrians and passengers	▪ Reduced CO_2 emissions from reduced fuel use and greater efficiency of city transport systems	▪ Reduced sprawl (and related problems associated with large informal settlements) can have significant benefits in helping cities cope broadly with climate vulnerability.	▪ Wide variety of opportunities in integrated transportation, land use, and infrastructure planning.	Medium-High
Promotion of Mass Transportation	▪ Reduced congestion ▪ Reduced ambient air pollution ▪ Improved economic productivity through improved transport efficiency ▪ Increased safety for pedestrians and passengers	▪ Reduced CO_2 emissions		▪ Greatest GCC opportunities through use of CNG or electric buses	High
Vehicle Inspection & Maintenance	▪ Reduced fuel costs for operators, due to efficiency gains ▪ Reduced ambient air pollution	▪ Reduced CO_2 emissions through efficiency gains	*Not Applicable*	▪ Ongoing experience indicates this is a highly valued approach in addressing local air quality and GHG emissions.	High
Electric Vehicles	▪ Reduced urban ambient air pollution ▪ Emissions displaced to power source (e.g., power plant)	▪ Possible reduced overall CO_2 emissions, depending on efficiency gains of energy from power plant sources vs. combustion of fuel in gasoline or kerosene-powred vehicles	*Not Applicable*	▪ USAID's ongoing IZET activity in India has provided insights into practical opportunities and constraints in introducing electric vehicles ▪ Cost constraints may be difficult to overcome	Medium-High
Conversion To Compressed Natural Gas (CNG)	▪ Possible reduced fuel costs for operators, depending on market price fluctuations and availability ▪ Reduced ambient air pollution	▪ Reduced CO_2 emissions, depending on technology used	*Not Applicable*	▪ India is already undergoing extensive conversion to CNG ▪ Unknown opportunities in Bangladesh, Sri Lanka, Nepal	India: Low Other South Asia: TBD
Converting vehicles	▪ Reduced fuel costs for operators,	▪ Reduced CO_2 emissions through	*Not Applicable*	▪ Efforts to date have been	High

from 2-stroke to 4-stroke engines	due to efficiency gains ▪ Reduced ambient air pollution	efficiency gains		highly successful, and many opportunities remain in a number of South Asian cities	
Fleet Conversion by Public and Private Institutions	▪ Possible reduced fuel costs for operators, due to efficiency gains or lower cost fuel prices, depending on the fuel used ▪ Reduced ambient air pollution	▪ Reduced CO_2 emissions, depending on technologies adopted	*Not Applicable*	▪ Opportunities exist to address policies and financing opportunities for fleet conversion. An important consideration is selecting vehicles that provide optimal efficiency gains for their intended uses	High

Small-Scale Power Generation

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Small-Scale Biogenerators	▪ Sound alternative energy source, reducing reliance on traditional fossil fuels while helping to reduce local waste management problems	▪ Reduced CO_2 emissions through efficiency gains	*Not Applicable*	▪ Ongoing efforts in South Asia have shown considerable promise ▪ Biomass generators, which burn biomass waste, can be very efficient sources of electricity	High
Renewables (e.g., solar)	▪ Could provide reliable, small-scale energy sources as backup for power outages or in off-grid locations ▪ Could reduce reliance on highly polluting diesel generators	▪ Reduced CO_2 emissions through avoidance of fossil fuels	*Not Applicable*	▪ Cost may be a factor in introducing a variety of renewable technologies, but their impact would be considerable in reducing local air pollution and GHG emissions	Medium

Municipal Facilities & Infrastructure

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Street Lighting	▪ Reduced electricity costs to municipal corporation	▪ Reduced CO_2 emissions through efficiency gains	*Not Applicable*	▪ USAID experience to date has shown considerable potential	High

Efficiency Measures in Municipal Buildings, Hospitals, and Schools	▪ Reduced electricity costs to municipal corporation	▪ Reduced CO_2 emissions at power source through efficiency gains	▪ In hospitals and medical clinics, improved capability to address disasters and health crises.	for continued work in this area. Energy and financial resource gains are generally easy to realize once an initial investment is made.	High

Urban Buildings

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Building Materials Produced through Energy-Efficient Means	▪ Reduced reliance on energy-intensive cement manufacture	▪ Reduced CO_2 emissions at power source	*Not Applicable*	▪ Some South Asian institutions (e.g,. Development Alternatives) have made significant gains in introducing new building design and manufacturing activities.	High
Energy Efficient Building Design	▪ Long-term benefits resulting from reduced reliance on energy for cooling or heating	▪ Reduced CO_2 emissions at power source	*Not Applicable*		High

Residential Housing

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Improved Demand-Side Management of Residential Energy Consumption	▪ Can lead to reeduced energy costs for residents	▪ Reduced CO_2 emissions at power source	*Not Applicable*	▪ Considerable success has been achieved by organizations working in South Asia (e.g., Alliance to Save Energy)	Low

Housing & Infrastructure Finance

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Financing Approval Criteria Promoting Climate-Friendly Investments	▪ Opportunity to promote GHG emissions mitigation and vulnerability and adaptation objectives.	▪ Possible reductions in GHG emissions, depending on projects developed.	▪ Vulnerability and adaptation issues to be addressed in project planning and development	▪ Current USAID-supported efforts could be restructured to incorporate more cross-cutting and climate-related factors in investment decisions	Medium-HIgh

Urban Environmental Management & Planning

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Vulnerability Assessments and Modeling	▪ Benefits for urban environmental management, infrastructure, development, and disaster management planning, particularly with respect to disaster preparedness and land use	*Not Applicable*	▪ Provides fundamental information about a broad range of vulnerability and adaptation issues in the urban context	▪ Highly important for coastal cities in India, Bangladesh, and Sri Lanka	High
Urban Environmental and Health Risk Assessments, Urban Environmental Mapping	▪ Benefits for urban environmental, infrastructure, disaster management, and health planning on multiple levels	*Not Applicable*	▪ Complements new efforts to develop vulnerability and adaptation assessments, models, and planning actions	▪ Recent USAID efforts present an excellent experience base to develop more comprehensive risk assessment exercises that also contribute to vulnerability assessments and models.	High
Municipal Climate Change Strategic Planning	▪ Benefits for urban environmental, infrastructure, and transportation planning on multiple levels	*Not Applicable*	▪ Comprehensive effort to engage local government on climate change issues in a cross-cutting way and in multiple sectors. ▪ Efforts address planning, emissions monitoring and targeting, urban-climate demonstration projects.	▪ G/ENV/EET and RUDO/South Asia support for ICLEI currently under way	High

Disaster Planning

Technology or Action	Urban Development Benefits	GCC Emissions Mitigation Benefits	GCC Vulnerability & Adaptation Benefits	Strategy Considerations	Priority Ranking
Disaster Planning And Preparedness	▪ Broad benefits in addressing current disaster risks throughout the South Asia Region	*Not Applicable*	▪ Complements vulnerability and adaptation efforts on a variety of fronts (e.g., related to severe weather impacts, floods, droughts, etc.)	▪ USAID experience in promoting disaster planning and preparedness will be increasingly relevant as climate change exacerbates disaster risks in South Asian cities	Bangladesh, Sri Lanka, India: High Nepal: Low

Annex B: USG Activities Addressing Urban Development and Climate Change in South Asia

Acronyms/Abbreviations	
*	Scale of Activity (i.e., municipal, state, national, regional)
ADPC	Asian Disaster Preparedness Center
E3	Office of Energy, Environment, and Enterprise (USAID/India Mission)
EET	Office of Energy, Environment, and Technology (USAID Center for Environment)
M	Municipal-level activity
N	National-level activity
N/A	Information not available
R	Regional (multi-country) activity
RUDO	Regional Urban Development Office for South Asia (USAID/India Mission)
S	State-level activity
USAEP	United States Asia Environmental Partnership

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					India		
Agra	Uttar Pradesh	M	RUDO	**NGO Support Program/India – Indian Environmental Society**	The Indian Environmental Society (IES), a national level NGO, is involved in selected neighborhoods of the Tajganj area that lie within the Agra Heritage Trapezium on community based solid waste management. This pilot activity includes community education and awareness raising effort, transformation of rag pickers into "street beautifiers", training on aerobic composting and recycling for income generation. Last review report mentioned RUDO's support in providing technical and financial support to IES on a pilot Solid Waste Management activity particularly for the components on training, skill upgradation and awareness raising. The objective was that a self-sustaining community-based approach will prove replicable throughout the heritage area and can be integrated into the city's overall planning for solid waste management. RUDO continues to support this effort of IES in the expansion and strengthening of a successful community participative waste management system in the Taj Ganj Area of Agra City. http://www.makingcitieswork.org/southasia/ngo.html	N/A	N/A
Agra	Uttar Pradesh	M	RUDO	**Urban Environmental Infrastructure Services (P.U.**	City SWM report completed.	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
				Asnani)			
Ahmedabad	Gujarat	M	RUDO	**FIRE - Ahmedabad Water Supply and Sewerage Project**	India's first municipal bond without a state guaranty was issued to partially finance this project. In addition to working with the corporation, the FIRE project provided assistance to the range of private consultants engaged by the city. The methodology for evaluating and rating municipalities - the first of its kind in India - was developed by CRISIL, with the assistance of the FIRE project.	N/A	N/A
Ahmedabad	Gujarat	M	RUDO	**FIRE - The Ahmedabad Walled City Revitalization Project**	Represents an approach to identification of potential CVIPs through a comprehensive urban planning process	N/A	N/A
Ahmedabad	Gujarat	M	RUDO	**FIRE - various water and sewerage projects**	In year 2000 Housing and Urban Development Corporation (HUDCO) borrows remaining US$20 million of an original US$125 million Urban Environmental (UE) credit authorization for various water and sewerage projects in Ahmedabad.	N/A	N/A
Ahmedabad	Gujarat	M	RUDO	**Community Infrastructure Finance and Implementation (CIFI)**	While the Pune pilot activity was on-going, RUDO/USAID received a request from the Gujarat Mahila Housing Sewa Trust (GMHST), an affiliate of SEWA, Ahmedabad for supporting a demonstration project in Ahmedabad. The proposal was to develop a widely replicable, low-income community based approach to basic service financing and infrastructure provision that are integrated within the overall city development process. This was an opportunity for USAID to bring in the experience gathered from the previous pilot activity and test the different recommendations generated through it through actual field applications. Using bilateral (TASP) funds of $350,000, a cooperative agreement was undertaken with the Housing and Urban Development Corporation (HUDCO) to take up this demonstration project as per the MEA directives. HUDCO will in turn support the GMHST to work with the Ahmedabad Municipal Corporation and other local entities in five slum settlements in Ahmedabad. This 18 month long program is developing and implementing a new community based partnership approach in infrastructure investment planning and providing environmental infrastructure in low-income settlements on a financial and socially sustainable basis. The impacts expected would be an increase in the productivity of the low-income households, decrease in the levels of malnutrition, infant mortality, incidence of morbidity and mortality related to various water-borne diseases and diseases usually associated with worsening environmental conditions. http://www.makingcitieswork.org/southasia/cifi.html	N/A	N/A
Ahmedabad	Gujarat	M	RUDO	**Centre fir Environment Planning and Technology (CEPT)**	Environmental Risk Assessment complete.	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
Ahmedabad	Gujarat	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed.	N/A	N/A
Ahmedabad	Gujarat	S	US-AEP	**Seminar on AIWPS Technology on Wastewater Treatment**	Involving P.U. Asnani, possibly to take place in Ahmedabad.	N/A	N/A
Ahmedabad	Gujarat	S	US-AEP	**Seminar on Clean Technology for Hospitality Industry**	N/A	N/A	N/A
Bangalore	Uttar Pradesh	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed. Workshops help to finalize strategies for implementing improved solid waste management practices. http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Baroda	Madhya Pradesh	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed. Workshops help to finalize strategies for implementing improved solid waste management practices. http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Bilaspur	Madhya Pradesh	M	N/A	N/A	USAID assistance to BSES Limited (formerly Bombay Suburban Electric Supply Company) to establish the first private sector power coal washing facility in Bilaspur, Madhya Pradesh with U.S. joint venture partners.	N/A	N/A
Bhopal	Madhya Pradesh	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed. Workshops help to finalize strategies for implementing improved solid waste management practices. http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Bhuvanesh-war		M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report to be completed.. . http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Calcutta	West Bengal	M	US-AEP	**Study of Efficient Environmental**		N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
				Management for Housing			
Chennai	Tamil Nadu	M	RUDO	**NGO Support Program/India – EXNORA International**	Founded in 1989, EXNORA has already created widespread environmental and civic awareness in the city of Chennai by promoting voluntary community efforts on waste disposal and urban management at the neighborhood and street levels. At present, over 1,000 'Civic Exnoras' or citizen-bodies are functioning successfully in the city. In FY98, support was extended to conduct a environmental youth service workshop programme to sensitize the local youth from low income communities on the importance of natural systems such as wetlands as valuable ecosystem habitats and to produce a environmental citizen's report. Also, support was extended to improve the health and sanitation of a low-income settlement in Chennai and in particular to create toilet block and biological sewage treatment units. In Cochin, support was provided to Exnora to develop a strategy on expansion of community based garbage mangement and vermiculture composting. Last year, grant support was provided to Citizens Waterways & Water Bodies Monitoring Program (WAMP), of EXNORA, a non governmental organization in Chennai to undertake a comprehensive project on paper recycling and training of the youth and low income community at Narikurava Colony in Chennai. http://www.makingcitieswork.org/southasia/ngo.html	N/A	N/A
Chennai	Tamil Nadu	M	RUDO	N/A	Environmental Mapping	N/A	N/A
Cochin	Kerala	M	EET	**Vulnerability Assessment Toolkit**	Activity beling developed by G/ENV/EET in collaboration with Tom Wilbanks of ORNL. Cochin is a strong candidate for this activity.	FY01	Oak Ridge National Labs
Cochin	Kerala	M	RUDO	**Urban Revitalization**	This activity involves several initiatived in revitalizing the Historic city of Cochin. A Strategic Environmental Infrastructure Plan For The Municipal Corporation Of Cochin was prepared to provide the local authority with a strategic plan to address the environmental conditions in the city, identify critical environmental stress areas, and prioritize investments to upgrade infrastructure. The report aimed to support the Cochin Corporation in preparing its comprehensive developmental strategy and in identifying appropriate programs and projects under the annual workplans of different city departments. The report contained a critical review of the growth of the Cochin urban agglomeration and the existing environmental conditions. Based on the existing condition and projected growth trends, it analyzed the prospective demand and growth potentials for environmental infrastructure. The report highlighted the strategic issues pertaining to comprehensive planning of urban environmental infrastructure in the city. The document also made a series of recommendations aimed at ameliorating the existing deficiencies and provided a list of activities to be taken up as immediate as well as medium-term programs that the ULB would consider while preparing its developmental strategy and annual workplans. The report was an important document for the Cochin Coporation and based on the recommendations, the Cochin Corporation prepared many of its activities, i.e., Canal revitalization and solid waste management projects. ▪ One of the major problems of Cochin identified in the strategic environmental	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					infrastructure plan was the drainage of wastewater. Historically, numerous canals had serviced the city, as receptacles for excess water and as major transportation modes. Unfortunately, the canals transformed into receptacles for waste and became a nuisance to the adjoining settlements. Frequent outbreaks of filaria and a recent epidemic of typhoid made the canals serious health hazards to the city. On the other hand, the city had no drainage plans and the municipal corporation did not have information on the canals nor about their existing condition and status. Under ICMA's Resource City Program, RUDO supported the city corporation to take up a pilot project on wastewater drainage. One of the major canals, Boundary Canal, passing through densely populated areas was identified and a rapid assessment of its environmental status and mapping of the physical properties and hydrology was carried out particularly, for the stretch within the urban limits. Subsequently, based on the analyses of the data, a proposal was prepared for locally dredging the canal to ensure its flushing and reducing the health risk, removing or reworking on the flow-through obstructions, i.e., culverts, levees etc. paving of the banks with an approach road for regular O&M and upgrading those slum settlements that were alongside the canal by improving their drainage and sewage systems and solid waste management. The Cochin corporation has already initiated this work and a major portion has been accomplished. ▪ In collaboration with Exnora Intl., the Cochin corporation initiated community based solid waste management in different parts of the city. Exnora has organized the communities at the ward level for managing the garbage. This included segregation of the recyclable and the organic waste at the household level and proper storing and handling. It reorganized the rag pickers and provided adequate equipments, i.e. gloves, shovels etc. It also organized their 'beats' and time management to increase their service efficiencies. The corporation with assistance from the private sector provided garbage removal vehicles (tri-cycles) and ward-level compost pits. The rag pickers trained by Exnora manage the pits and compost the waste. The compost is finally sold and the resources put back into the system. Presently, four pits are in operation serving over 3000 households. More of such systems are proposed by the corporation in other wards. The Corporation proposes to take up an awareness program in the slum settlements and for school children. http://www.makingcitieswork.org/southasia/cochin.html		
Cochin	Kerala	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report to be completed.. . http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Cuttack	Orissa	M	RUDO	**Urban Environmental Infrastructure**	City SWM report completed.	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
				Services (P.U. Asnani)			
Dirgapur	West Bengal	M	N/A	N/A	N/A	N/A	N/A
Delhi	Delhi	M		**Inspection & Maintenance Camp for Two-Wheelers**	USAID and the Society of Indian Automobile Manufactures (SIAM) sponsored the first ever series of free inspections and maintenance camps for two-wheeled vehicles (scooters and motorcycles). The camps, held over a two-week period in November 1999, provided free tune-ups, maintenance, and awarded Pollution-Under-Control stickers to Delhi cycle owners. For the two-wheelers in need of more extensive repairs, the manufacturers offered coupons and discounts on parts and labor. Free safety checks also were offered. SIAM, in coordination with the Delhi Government, conducted the camps in twelve locations around the city and checked 66,417 scooters and motorcycles during the campaign. Of this total, 11,778 were repaired on site, while only 454 had to utilize the manufacturers services. On December 20, 1999, the U.S. Embassy, in coordination with SIAM conducted its own vehicle inspection and maintenance camp for employees' two-wheelers. Of the 333 vehicles reporting to the camp and earning Pollution Under Control stickers, 47 received maintenance n site. Only one vehicle failed to pass the inspection.	11/99	N/A
Delhi	Delhi	M		**Eco-Park/Chilla Village**	This Project has been stalled . Treatment and safe disposal of urban waste is a major problem in India. In particular, the facilities available for treatment and disposal of sewage in cities and smaller urban centers are inadequate. According to the 1991 Census, piped sanitation or sewerage covered only 35.5 percent of India's urban population. In Delhi, it is estimated that almost 70 percent of the total sewage generated per day goes untreated and are directly disposed into rivers and other waterbodies. The pollution level of river Yamuna is reported to be very high. Nearly 2000 million liters of sewage and industrial effluent is discharged daily into the river. As a result, the entire stretch of the river in Delhi has become a flowing mass of waste water. In order to test whether a low-cost, environmentally appropriate technology that can be managed by local communities is feasible, Project Concern International/Delhi (PCI) is conducting a feasibility study for developing an Eco-Park at Chilla village. The proposed Eco-Park at Chilla village will essentially constitute a series of wastewater treatment technologies based on WSPS principles. The system will include sewage inlets and outlets, aeration tanks, root-zone settlement tanks and channels, duckweed ponds, polishing ponds or pisciculture tanks. It is expected that such an integrated system of sewage treatment technologies will reduce the BOD from the existing high levels to levels that are within acceptable norms. This system will not only improve the environmental condition of the village, but also render the final sewage or effluent outflow quality equivalent to the level of water quality considered safe for agricultural purposes. Further, it will tremendously reduce the existing pollution load of the Hindon-Cut (since the final effluent is disposed into the Hindon river, which in turn disposes off into the Yamuna river). The system will also provide opportunities for micro-business ventures that includes commercial fruits & vegetable raising, algae-farming, pisciculture and biogas generation (in line with	11/99	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					methanation and GHG concerns). http://www.makingcitieswork.org/southasia/chilla.html		
Delhi	Delhi	M	RUDO	**NGO Support Program/India – Delhi Action Group (DAG)**	Last review report on DAG described the common workplan drawn up to put in place an annual activity calendar. The workplan had identified three thrust areas under which all activities will be organized: Land Management for Informal Settlements, Environmental Infrastructure for Slum Settlements and Microenterprise for Women. Since then, DAG has successfully organized a Regional Workshop on "Community Action for Environmental Management" in Delhi. The Delhi workshop (December 3-4, 1999) helped bring important stakeholders in the city together to have an opportunity to be exposed to the best practices in the South Asia region. Action plans on Solid Waste Management, Industrial Waste Mangement and Hospital Waste Management has been drafted, based on the workshop deliberations. These will be presented to different government agencies and ULBs. RUDO continues supporting DAG in its various efforts to strengthen the common platform for exchange of experience and collaborative approaches. RUDO is providing technical and financial assistance for project formulation and implementation of selected activities. http://www.makingcitieswork.org/southasia/ngo.html	N/A	N/A
Delhi	Delhi	M	RUDO	**NGO Support Program/India – Health Impact of Urban Environmental Services**	USAID contracted ASHA, a premier NGO of Delhi to assess the linkage of urban infrastructure provision to community health and develop a reporting system for measuring the benefits accruing to urban low-income communities as a result of better access to basic municipal services. ASHA was involved in 22 slums in Delhi organizing the communities, providing health services, sanitation facilities and shelter as well as awareness programs for empowerment of women. ASHA undertook a primary survey in the slum settlements to identify possible linkages between availability of infrastructure services and health conditions and come up with key parameters that define and affect such relationships. ASHA also identified and listed health indicators that were sensitive to environmental conditions and depended on the availability of basic infrastructure services. Most of the indicators were related to water-borne and vector-borne diseases and were of two types: Indirect indicators of health like use of ante-natal, child immunization and family planning services; and Direct indicators of morbidity of fever like jaundice, dysentery and diarrhea and itching and worm infestation (particularly in children). While direct correlation was not found between the indirect health indicators and access to infrastructure services in the short term, there was however, indications that the degree of access to basic services influenced household hygiene conditions which led to more acceptance and better utilization of health facilities, i.e., family planning methods. The association between the morbidity factors and utilization of basic services was again, not exclusively dependant on the use of such infrastructure facilities but also on the behavioral practices, i.e., in regard to the appropriate use of the Facilities. Very high association was however found between the distance of the shelter from the sources of waste, which were the breeding grounds for various vectors, and incidence of disease. The study also provided an opportunity to RUDO to collaborate with the	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					Mission's health program by putting together a project on infectious diseases in urban settlements. http://www.makingcitieswork.org/southasia/ngo.html		
Delhi	Delhi	M	US-AEP	**Particulate Matter Source Attributions Assessment and Monitoring**	N/A	N/A	N/A
Faridabad	Haryana	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed.	N/A	N/A
Gandhina-gar	Gujarat	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed. Workshops help to finalize strategies for implementing improved solid waste management practices. SWM workshop held. http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Hyderabad	Andhra Pradesh	M	RUDO	**FIRE - Hyderabad Municipal Corporation**	The FIRE project provided technical assistance to improve the municipal corporation's financial management and accounting systems. This included the development of a statement of revenues and expenditures on an accrual basis to monitor the financial performance of the corporation, and a statement of assets and liabilities on an accrual basis to determine the financial position of the corporation.	N/A	N/A
Indore	Madhya Pradesh	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed. SWM workshop held. http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Jaipur	Rajasthan	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed.	N/A	N/A
Kolhapur	Maharashtra	M	RUDO	**FIRE - Kolhapur Solid Waste Disposal Project**	The FIRE project supported the structuring of this project as a BOOT arrangement. With government approval recently obtained for the leasing of municipal land for the disposal site, the last bureaucratic hurdle in the way of the signing of project documents has been removed.	N/A	N/A
Kolhapur	Maharashtra	M	RUDO	**FIRE - Kolhapur**	In year 2000 signed a 30-year BOOT contract with the Indian firm, Zoom Developers in	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
				Municipal Corporation	association with Larsen Engineering (US), for solid waste treatment and disposal.		
Lucknow	Uttar Pradesh	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report to be completed.. . http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Mumbai	Maharashtra	M	E3	**Environmental Resource Center in Mumbai**	The new Environment Resource Center will assist industries and society to handle pressing environmental problems, including GCC, solid waste, water pollution, etc.	N/A	US-AEP, U.S. Foreign Commercial Service, ICICI and IDBI
Mumbai	Maharashtra	M	US-AEP	**Wastewater Technology Review**	N/A	N/A	N/A
Nagpur	Maharashtra	M	RUDO	**FIRE - Nagpur Water Supply and Sewerage Project**	The FIRE project assisted the city in development of RFP documents for consultancy services that combined technical, engineering and financial services.	N/A	N/A
Nagpur	Maharashtra	M	RUDO	**FIRE - Nagpur Solid Waste to Energy Project**	Supported through USAID Housing Guaranty (HG) resources, once completed, this will be one of India's first municipal solid waste to energy projects.	N/A	N/A
Pune	Maharashtra	M	RUDO	**FIRE – Pune Water Supply and Swerage Project**	Proposed the introduction of private sector participation in turnkey construction, operation and maintenance, and billings and collection. By securing an in-principle commitment from ICICI, favorable reviews by HDFC and the Bank of Maharashtra, and the PMC, the project broke new ground in introducing new domestic financial institutions into the urban environmental infrastructure sector. During the process, the PMC also utilized domestic legal advisors and the Infrastructure Development and Finance Company (IDFC) as financial advisors.	N/A	N/A
Pune	Maharashtra	M	RUDO	**Community Infrastructure Finance and Implementation (CIFI)**	Based on field information collected from different slum settlements of Pune particularly on coping strategies that low- income households adopt for fulfilling their needs for basic municipal services, a strategy for provision of infrastructure to low-income communities on demand basis was consequently developed. In general, pilot study established the widely held notion that the poor pays substantially for the lack of infrastructure and that they not only can but are willing to pay for improved services. The study also indicated the need for planning incremental improvements in service provisions. As and when households improve their economic conditions, the need for and the level of provision of services tend to increase. As a result, planning and designing of infrastructure should be such that there is flexibility and scope for upgrading and increasing the levels of service provisions, viz., from water stand-posts at community level to individual connections. The proposed strategy also included utilization of community based organizations (CBOs) for infrastructure provisions, O&M and collection and management of service	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					charges and the utilization of microfinance strategies to organize community mobilization of finance. http://www.makingcitieswork.org/southasia/cifi.html		
Shimla	Himachal Pradesh	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed. Workshops help to finalize strategies for implementing improved solid waste management practices. http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Surat	Gujarat	M	RUDO	**FIRE - Surat Solid Waste Disposal Project**	The FIRE project assisted the city in developing the pre-qualification documents for a solid waste disposal project. This project has been designed on a BOO basis.	N/A	N/A
Surat	Gujarat	M	RUDO	**FIRE - Surat Inner City Revitalization Project**	Represents an approach to identification of potential CVIPs through a comprehensive urban planning process.	N/A	N/A
Tirupur	Tamil Nadu	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed. Workshops help to finalize strategies for implementing improved solid waste management practices. http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Tirupur	Tamil Nadu	M	RUDO	**FIRE - Tiruppur Area Development Program**	India's first water supply and sewerage project with private sector participation to be structured along commercial lines. India's first public-private company in the water and wastewater sector was formed under this arrangement. Financial closure on this project is anticipated by March 2000.	N/A	N/A
Udaipur		M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed.	N/A	N/A
Varanasi	Uttar Pradesh	M	USAID	**Feasibility report for an alternate Ganga Action Plan (GAP)**	The Sankat Mochan Foundation (SMF), a premier NGO of Varanasi, proposed an alternative solution to Varanasi's sewage treatment needs using an U.S. technology, Advanced Integrated Wastewater Ponding System (AIWPS) developed at the University of California at Berkeley. The system, which requires very low energy inputs for its operation and produces a safe, pathogen-free effluent, has proven effective during more than 30 years in numerous installations both in the U.S. and other countries. SMF is promoting this technology because: 1) it removes the fecal matters from the sewage; and 2) it is non-mechanized and minimizes the reliance on electricity for operating the system, which is especially important for an area that suffers from unreliable power supply. As part of the implementation of the GAP, Phase II, the Varanasi Nagar Nigam, VNN (municipal corporation) and SMF submitted to the NRCD a detailed project	N/A	Sankat Mochan Foundation; Friends of Ganges NGOs are now in San Francisco, Sweden, and Australia.

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					feasibility report for intercepting the sewage that discharges into the holy river and treating it using the AIWPS technology. Cleanup of the Ganges river focuses on the 100 religious ghats where nearly 60,000 people bathe daily. http://www.makingcitieswork.org/southasia/varanasi.html		
Varanasi	Uttar Pradesh	M	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	City SWM report completed. Workshops help to finalize strategies for implementing improved solid waste management practices. http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Vijayawada	Andhra Pradesh	M	RUDO	**FIRE – Vijayawada Capital Investment Program**	This program was particularly noteworthy for its security arrangements and financial packaging, which introduced the concept of "senior mezzanine debt" and which provided a model for smaller cities that may be limited in their ability to access the capital market. The FIRE project provided support to CRISIL in producing a credit rating for Vijayawada. This rating was based on a structured debt obligation - an innovation in India - through which debt instruments are secured by the cashflow from a specific asset or a pool of assets.	N/A	N/A
Calcutta, Howrah, Tirupur, Tuticorin, Chennai, Salem, Vellore, Hyderabad, Bangalore, Mumbai, Pune, Thane, Pimpri Chinchward, Bhopal		M	US-AEP	Improved Urban Environmental Management	Extensive number of projects promoting improved urban environmental management, primarily to enhance solid waste and medical waste management. Additional information is available in US-AEP FY01 (Draft) Workplan.	N/A	N/A
Calcutta, Baroda		M	ADPC	India: Technological Hazard Mitigation in Baroda and Metropolitan Calcutta	The AUDMP India project launched from October 1997 is implemented by Baroda Citizens Council (BCC), assisted by Urban Studies Center, Times Research Foundation (TRF). The Indian government has identified numerous manufacturing and hazardous materials storage sites in densely populated urban areas. The objective of the India project is to reduce the vulnerability of the population and infrastructure to technological/industrial hazards in selected municipalities or districts within the metropolitan Calcutta and Baroda areas. The first phase of the project consists of hazard mapping and vulnerability assessment for the target municipalities, as well as the development of guidelines for incorporating technological hazards into urban development planning. During the second phase, a full-scale mitigation strategy and off-	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					site emergency preparedness plan will be prepared and implemented for one of the cities. http://www.adpc.ait.ac.th/audmp/India.html		
Delhi, Agra, Pune		M	EET	**Transportation and Electric Vehicles**	USAID is sponsoring activities designed to leverage public and private investments in electric vehicles. A prime objective of the program is to reduce particulate matter and lead in the urban environment. Tricon Restaurants (Pizza Hut) in Delhi. Sheraton in Agra. Pune University Campus.	1996-2002	*Partners:*Nexant (formerly Bechtel); Bajaj Auto, New Generation Motors *Contact:* Sam Schweitzer G/ENV/EET
Surat, Nagpur		M	RUDO	**FIRE - $10m US capital market loan for water supply and sanitation projects**	USAID guaranteed this loan as part of the development assistance under its Financial Institutions Reform and Expansion (FIRE) program. These projects, when completed, would facilitate delivery of urban environment infrastructure services to low-income families in Nagpur and Surat. In his remarks, Mr. Randolph noted that these projects would improve the living conditions of nearly 3.5 million people including close to 1 million slum dwellers in these cities. The loan was disbursed on September 24, 1999.	1999	HUDCO
Salt Lake City, Bhadreshwar, Bavipur	West Bengal	M/S	RUDO	**Urban Environmental Infrastructure Services (P.U. Asnani)**	Technical assistance for designing a SWM system provided through an NGO at the request of the West Bengal Pollution Control Board. http://www.makingcitieswork.org/southasia/ueias.html	N/A	N/A
Not Applicable	Gujarat	S	US-AEP	**Water and Wastewater Recycling and Reuse – Training Project**	N/A	N/A	N/A
Not Applicable	Maharashtra	S	RUDO	**Urban Environmental Management Tool Kits – Environmental Status Report**	N/A	N/A	N/A
Not Applicable	Tamil Nadu	S	RUDO	**Urban Environmental Management Tool Kits – City Corporate Plans**	N/A	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
Not Applicable	Andhra Pradesh	S	RUDO	**City Manager Associations**	City Manager Association inaugurated in Andhra Pradesh, August 17, 2000.	2000	ICMA, NIUA
Not Applicable	Maharashtra	S	RUDO	**FIRE – Government of Maharashtra (GOM) Sukthankar Committee**	In year 2000 Government of Maharashtra (GOM) Sukthankar Committee, which was set up to propose reforms in the state's water and sanitation sector, issues first-of-its-kind for India discussion note calling for an independent regulatory commission for water supply and wastewater and a cabinet note granting approval for the restructuring of the state's capital grants program for urban water supply to achieve efficiency improvements such as reduction in unaccounted for water, energy savings in water pumping, as well as exploring the potential for private sector participation in systems operation.	N/A	N/A
Not Applicable	Maharashtra	S	RUDO	**FIRE – Roadmap for Private Sector Participation (PSP) in urban water and sanitation in the State of Maharashtra**	To be developed through a two-track consultative and project development process, the potential key elements of this roadmap include: The context and forms of PSP, as a solution to specific local problems; Legal and institutional reforms required; Incentives, to both the private and public bodies, for the development of the sector; Review of the procurement and bidding process, including evaluation; Tariff reforms with incentive-based financing mechanisms; Procedural, administrative, technical and financial support from the state government; Regulatory mechanism and the appropriate role for consumers.	N/A	N/A
Not Applicable	*Not Applicable*	S/ N	US-AEP	**Workshop on Air Pollution Control for the Southern Region**	N/A	N/A	N/A
Not Applicable	*Not Applicable*	S/ N	US-AEP	**Mobile Air Emissions Demonstration (Northern Region)**	N/A	N/A	N/A
Not Applicable	*Not Applicable*	S/ N	US-AEP	**Mobile Air Emissions Testing Technologies (Northern Region)**	N/A	N/A	N/A
Not Applicable	*Not Applicable*	N	USAID	**$45m Clean Energy and GCC Program (ECO & GEP)**	March 23, 2000, President Clinton announced a $45 million energy and global climate change program. The funding includes $20 million in additional funding for a three-year extension of the Greenhouse Gas Pollution Prevention Project (GEP) and $25 million for the new Energy Conservation and Commercialization (ECO) project. (See below.)	2000-	N/A
Not Applicable	*Not Applicable*	N	E3	**Greenhouse Gas Pollution Prevention Project (GEP)**	Centerpiece GCC activity. Activities under the GEP program aim to reduce the volume of emissions of greenhouse gases by increasing energy productivity and encouraging the switch to biomass fuels. The project supports efficiency in coal-fired power plants by introducing environmentally friendly technologies and promoting the use of alternative energy sources.		*Contact:* Kavita Sinha

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
Not Applicable	*Not Applicable*	N	USAID	**Energy Conservation and Commercialization (ECO)**	ECO -- a Rs. 145 crore ($33.4 million) five-year program -- will target the reduction of greenhouse gas emissions per unit of electricity generated in India. USAID is providing Rs. 108 crore ($25 million) in technical assistance and training to the Ministry of Power, electric utilities, and regulatory commissions to develop an appropriate market-oriented policy environment. ECO will enhance the capabilities of the private and financial sectors to deploy market-based mechanisms for energy efficiency investments. As part of ECO, a Rs. 43 crore ($10 million) loan fund will be established through ICICI Limited to provide financial incentives for market development activities that demonstrate a reduction in perceived risks of energy efficient undertakings. The ECO project is a continuation of USAID/India's ongoing efforts to help India improve the efficiency of its power sector and reduce its greenhouse gas emissions. Activities under the ECO project aim support power sector and regulatory reforms such as the creation of a state-level electricity regulatory commission. ECO will also promote market-based approaches, such as an incentive schemes for energy-efficient businesses.	N/A	N/A
Not Applicable	*Not Applicable*	N	E3	**Energy Management Consultation And Training Program (EMCAT)**	Omnibus energy program. DSM, regulatory reform. Included a renewable energy component that promoted electric vehicles, to help identify the first electric car company (Reva) in India. Working in conjunction with EET office's electric vehicle project. Work under EMCAT includes DSM efforts in water pumping and energy efficiency, as well as energy efficient lighting, in collaboration with the Ahmedabad Municipal Corporation. From the website: EMCAT is a United States Agency for International Development (USAID) sponsored project to improve the management of the supply and end-use of energy in India. Approximately $22 million of USAID funding, in conjunction with about $600 million in loans from international development institutions, is providing technical assistance, training, and equipment to public utilities, private industry and energy professionals throughout India. The intent of the program is to improve the availability, reliability, and efficient use of energy through improved management, policy reform, and public awareness. The current project is scheduled to run through March 1997. Resource Management Associates of Madison, Inc. (RMA) is the lead technical firm charged with managing the Demand Side component of the EMCAT project. The purpose of the project is to develop, manage and disseminate energy efficiency and demand-management programs - demonstrating energy efficiency and conservation potentials in India. Assistance is being provided to improve energy auditing skills and techniques; to develop utility-based demand side management (DSM) programs; to promote the development of Energy Service Companies (ESCO's); to identify energy-efficiency technology improvements in Indian industry; to facilitate financing programs for energy efficiency; and to provide funds for procuring energy auditing equipment for Indian consultants. It is expected that the activities of the EMCAT project will, in addition to improving the energy situation in India, provide linkages between U.S. and Indian businesses, introduce U.S. manufactured energy efficiency products to the Indian market and increase our knowledge of the energy situation in India.	N/A	*Contact:* Richard Edwards

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					http://www.usaid.gov/countries/in/emcat		
Not Applicable	*Not Applicable*	N	E3	**Clean Technology Initiative (CTI) for Industry**	CTI constitutes the second phase of USAID's Trade for Environmental Services and Technology, which attempts to establish clean technologies and management systems within Indian industry. Working with the Confederation of Indian Industry (CII) and the Steel Authority of India Limited (SAIL), CTI is actively promoting the adoption of ISO 14001 standards through demonstration pilot projects. CTI is also working closely with cement and agro-pulp and paper industries to pilot a new rating system that measures each facility's performance against the best of the district; manuals detailing all of the processes will be available with the Cement Manufacturers Association and the Indian Agro Paper Mills Association. This collaboration is anticipated to facilitate capacity building and demonstrate improved environmental and economic performance. CTI is also involved in the new Environmental Information Center being established at the Federation of Indian Chamber of Commerce and Industry (FICCI). EIC will serve as a foundation of information regarding the adoption of environmentally-friendly techniques for the both the private and public sectors. The United States-Asia Environmental Partnership (US-AEP) is also working with CTI by conducting lectures, workshops, and tours to promote business exchanges. CTI is currently focused in the following areas: Awareness raising and information outreach - stimulating interest and participation of Indian industries in improved environmental management; Private sector environmental incentives - strengthening and publicizing market-based incentives for corporate environmental responsibility; Indian industry capacity development - strengthening the organizational learning process within Indian firms related to environmental management; Commercially-oriented technology cooperation -- catalyzing information, technical assistance, and funding.	1997-2002	Industrial Credit and Investment Corporation Limited (ICICI); Federation of Indian Chamber of Commerce and Industry (FICCI); US-AEP
Not Applicable	*Not Applicable*	N	USAID	**Climate Change Center**	USAID assistance to the Confederation of Indian Industry's (CII) Climate Change Center enables CII to support its constituents in screening potential GHG emissions offset projects. Fifteen projects are being developed, including waste-heat-recovery power generation, co-generation, and process-efficiency improvement projects. Development Alternative's (DA) Climate Change Center also received USAID technical assistance for screening and developing up to ten decentralized renewable energy projects to offset GHG emissions. The CII Climate Change Center will be the Indian counter-part agency for TCAPP.	N/A	N/A
Not Applicable	*Not Applicable*	N	E3	**Bagasse Cogeneration**	USAID provides investment grant assistance through IDBI to nine sugar mills to set up nearly 200 MW of bagasse (waste from sugar cane crushing) cogeneration units to supply of power to the grid based entirely on biomass fuels. Of these nine sugar cogeneration facilities, four were commissioned and supplied nearly 300 million kilowatt hours of biomass-fired electric power last year. In addition, USAID's technical assistance has, in part, helped develop a pipeline of further 200 MW sugar cogeneration facilities. This activity build on the previous work of USAID on policy studies for	1992-2002	*Partners:* Industrial Development Bank of India *Contact:* Richard Edwards

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					opening the market for cogenerated power. The establishment of government policy and appropriate tariffs for cogenerated power was in part a result of USAID policy studies.		
Not Applicable	*Not Applicable*	N	E3	**Climate Change Initiative for Sustainable Development**	This activity supports development of institutional capacity of various different stakeholders in India to design and implement policies and projects that reduce GHG emissions while promoting sustainable development with USAID technical assistance and training support. Under this project, the CII and the Society for Development Alternatives have established climate change centers. These centers conduct workshops, research policy, and develop communication material to educate their constituents of challenges and opportunities arising from climate change mitigation. With USAID assistance, these centers are also engaged in developing projects and facilitating investment in GHG emissions reductions. This activity has recently expanded to include capacity building of a Government of India executive training academy on sustainable energy development. Indian financial institutions also receive technical assistance under this effort to improve financial appraisal skills for GHG emissions reduction projects.	1999-2005	*Partners:* Industrial Credit and Investment Corporation of India (ICICI); Confederation of Indian Industry (CII); Society for Development Alternatives (SDA)
Not Applicable	*Not Applicable*	N	E3	**Efficient Power Generation**	USAID's work with the NTPC has helped establish the Center for Power Efficiency and Environment Protection as the foremost center for providing technical leadership and advice to the electric power sector. USAID's power plant efficiency demonstrations with NTPC (whose 17 plants generate 25 percent of India's electric power) have been so successful that for one of the demonstrated programs the corporation is investing $2.5 million this year in new environmental equipment. This will save millions annually in coal purchases and will generate huge reductions in GHG emissions. USAID has helped open two new regional centers in India to provide efficiency improvement services to power plants. USAID is also supporting the development of new power plants based on advanced power generation technologies. These technologies not only reduce carbon dioxide emissions per unit of power, but will also help cut down the local pollution problems, as India doubles its mostly coal-based power generation capacity. USAID involvement is expected to help leverage a considerable amount of World Bank and GEF funding for project implementation.	1995-2005	*Partners:* National Thermal Power Corporation (NTPC) *Contact:* Richard Edwards
Not Applicable	*Not Applicable*	N	E3	**Energy Efficiency and Demand-Side Management**	Energy efficiency and DSM are major areas of USAID assistance, and this program has focused on four areas: DSM in utilities, energy efficiency in water pumping, energy efficiency standards, and labeling and policy support. Assistance was provided to Ahmedabad Electricity Company (AEC), a private sector utility, to design a DSM program. A number of pilot DSM projects have been initiated by AEC in the industrial and residential sectors. Technical assistance on DSM was also provided to two other state utilities, those in Haryana and Tamil Nadu. In Haryana, energy efficiency projects worth $30 million were developed, and in Tamil Nadu, a load research program with pilot program was carried out. USAID assistance has also helped design the adoption of an energy efficiency label by the Bureau of Indian Standards. USAID technical assistance to the Ministry of Power for development of policies to promote energy efficiency is an ongoing activity. This activity has recently been expanded to support	1992-2004	*Partners:* Ministry of Power; AEC; Industrial Credit and Investment Corporation of India (ICICI) *Contact:* Richard Edwards

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					local and institutional capacity building of the Ministry of Power to develop markets for energy efficiency investments. This activity will also work with financial institutions to develop new financial products to accelerate energy efficiency investment.		
Not Applicable	*Not Applicable*	N	USAID	**Environment Information Center (WWW)**	Scheduled to appear online at http://www.cleantechindia.com, the site will contain not only a database of clean technologies, management practices, equipment, and support services in the area but also links to similar websites around the world. FICCI intends to build similar hubs in Mumbai and Delhi, as well as Hyderabad, though that hub would be managed by Andhra Pradesh Chamber of Commerce. The site should be accessible by the end of June.		Indian Chamber of Commerce (ICC); Federation of Indian Chamber of Commerce and Industry (FICCI)
Not Applicable	*Not Applicable*	N	USDOE	**Internet-Based Information Resource and Discussion Platform on Greenhouse Gas Reduction Strategies in Asia**	USDOE and the TATA Energy and Resources Institute are collaborating to build an Internet-based information resource and discussion platform on the issues of energy efficiency and renewable energy technologies and GHG emissions in Asia. http://www.www.ccasia.teri.res.in	1999-2000	*Partners:* TATA Energy and Resources Institute (TERI) *Contact:* Kurt D. Zwally, USDOE Tel: 202-586-3423 Email: kurt.zwallyl @ee.doe.gov
Not Applicable	*Not Applicable*	N	E3	**Linking Urban Development and Climate Change**	This recently launched activity will focus on reducing carbon dioxide emissions from vehicular traffic and on methane emissions recapture from city-based municipal and industrial wastes. USAID technical assistance and training will increase institutional and human capacity of five municipal authorities to assess methane emissions and recapture potential in cities. USAID will also support development of a demonstration project and facilitate investment to demonstrate methane recapture technology. USAID assistance will help one city transport authority increase fuel efficiency and reduce both GHG and local pollutant emissions.	1999-2005	*Partners:*Industrial Credit and Investment Corporation of India (ICICI); City Municipal and Transport Authorities *Contact:* Richard Edwards
Not Applicable	*Not Applicable*	N	E3	**Power Sector Regulatory Reform and Restructuring**	USAID is providing support for the establishment of a policy, regulatory, and legal environment in the Indian power sector to create an enabling environment for enhanced private investment in the sector. USAID is providing extensive technical support to several state electricity regulatory commissions and the Central Electricity Regulatory Commissions in staffing plans, establishment of rules and procedures, and tariff guidelines. USAID is also providing technical assistance for power sector policy. In the state of Haryana, USAID technical assistance and training plays an important complementary role to the much larger World Bank ($600 million loan) and British Department for International Development (DFID $24 million grant) programs. USAID-supported technical assistance helped to identify and develop DSM projects to be funded from the $45 million DSM component of the World Bank loan.	1997-2004	*Partners:* Ministry of Power; Power Finance Corporation *Contact:* Richard Edwards
Not Applicable	*Not Applicable*	N	E3, EET	**Sustainable Cities Initiative**	Under this initiative, USAID and the Alliance to Save Energy have designated Ahmedabad as the first sustainable city in India. With few energy resources and	1998-2002	*Partners:* Alliance to Save Energy; Hagler

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					electricity demand rising by 5 to 6 percent annually, the city's utility could not keep pace with demand. The Alliance provided technical assistance to Ahmedabad and reaped impressive results. Along with Hagler Bailly Services, Inc. and USAID, the Alliance worked closely with the city to build support for an energy management program at the local utility, hired a full-time in-country coordinator to be a liaison, and introduced the concepts of lease financing and energy service companies. As a result of these efforts, the city government has established an official energy management cell and recently agreed to increase staff and funding for this new institution. To date, Ahmedabad has reduced peak electricity demand by 11%, saved more than $300,000 in energy costs, and reduced carbon dioxide emissions (a primary GHG) by 4,650 tons. USAID/India is currently funding the expansion of this activity in two other Indian cities: Chennai in Tamil Nadu and Pune in Maharashtra. The Alliance team is also examining the broader issues related to urban energy management. These issues include water management and conservation, institutional development, NGO development, and energy service company (ESCO) development.		Bailly Services, Inc.; Municipal governments *Contact:* Carl Duisberg, G/ENV/EET
Not Applicable	*Not Applicable*	N	EET	**Utility Partnership Program**	Funded by USAID, the USEA is implementing the Utility Partnership Program in India. The program's main objective is to provide a mechanism for the U.S. energy industry to transfer its experience in market-based energy production, transmission, and distribution to its international counterparts, while providing the U.S. utilities with an opportunity to learn about the energy industry in other countries. The partnership program has established eight partnerships in the country, three of which are regulatory partnerships, and complements USAID/India's regulatory reform activities.	1997-2002	*Partners:* USEA *Contact:* Gordon Weynand, G/ENV/EET
Not Applicable	*Not Applicable*	N	E3	**Sustainable Living – A Teacher-Student Movement for Energy Efficiency**	Idea is that students can educate their parents and others on the need for conservation and purchase energy-efficient goods. The 6-month pilot program entailed membership from four other city schools - Rosary Matric, St. Bedes, Santhome HSS, and Holy Angels, as well as SMC.	N/A	Citizens' Alliance for Sustainable Living, Chennai, and the Alliance to Save Energy., in association with Stella Maris College (SMC)
Not Applicable	*Not Applicable*	N	RUDO	**FIRE - National discussion on a municipal bond system in India**	In 1995, the FIRE project organized a national workshop entitled "Municipal Bond Experiences and the Potential and Relevance of a Municipal Bond System for India". The following year, the Ministry of Finance established the Rakesh Mohan Committee. This committee issued recommendations for capital market development, which included the development of a municipal bond system in India. Ahmedabad, in January 1998, became the first city in India and South Asia to issue a municipal bond without a state government guaranty to finance a water supply and sewerage project. Nashik and Ludhiana have also issued municipal bonds; bond issues are now being planned in several other cities.	N/A	N/A
Not Applicable	*Not Applicable*	N	RUDO	**FIRE - municipal credit rating**	Subsequent to the 1995 municipal bond workshop, the Ahmedabad Municipal Corporation (AMC) took the groundbreaking step of requesting a municipal credit rating.	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
				system	With technical assistance and support from the FIRE project, CRISIL worked to develop a methodology based on an assessment of urban local bodies in India and international experience in the rating of municipal bonds. In March 1996, Ahmedabad was the first city in India to receive a credit rating. Since then, over 30 other cities have followed suit.		
Not Applicable	*Not Applicable*	N	RUDO	**FIRE - municipal accounting and budgeting reforms for strengthening the role of the city in the finance system**	At the national level, the project supported and continues to support the Institute of Chartered Accountants of India (ICAI) in the development of uniform financial reporting formats for urban local bodies. The FIRE team supported the ICAI in setting up a sub-committee to formulate accounting standards for urban local bodies. It is also supporting the Tamil Nadu state government in the development and implementation of computerized double entry, accrual-based accounting systems for the state's 100+ urban local bodies.	N/A	N/A
Not Applicable	*Not Applicable*	N	RUDO	**FIRE - Supporting Improvements in Municipal Administration**	The City-Level Environmental Status Report (ESR) and City Infrastructure Priorities (CIP) methodology to identify infrastructure investment priorities, and an Urban Performance Indicators System (UPIS) to provide a comparative database to analyze the relative infrastructure delivery, financial and administrative performance of cities. Checklists and reporting formats for project pre-identification, pre-feasibility and feasibility analysis; a computer-aided project financial assessment tool; and tendering guidelines for integrated financial and engineering consultancy services for project development. Use of private sector consultants to mange implementation of infrastructure projects on behalf of public sector entities, including the development of model contracts for construction, operation and maintenance, as well as billing and collections.	N/A	N/A
Not Applicable	*Not Applicable*	N	RUDO	**FIRE - Supporting the Capacity Building of Officials from the Urban and Financial Sectors**	Development of training modules on four topics, namely: project development for urban infrastructure, municipal finance and accounting, management of urban services, and urban environmental management to support NIUA's program of training local government officials. Dissemination of technical studies and project notes on pertinent FIRE project topics. Support for courses at the Center for Environmental Planning and Technology (CEPT), Ahmedabad, and at the School of Planning and Architecture (SPA), Delhi. Numerous presentations on various FIRE themes to public and private audiences at national, regional and state seminars and workshops.	N/A	N/A
Not Applicable	*Not Applicable*	N	RUDO	**FIRE - Technical Guide, ICAI**	In year 2000 the Institute of Chartered Accountants of India (ICAI) prepared and circulates a Technical Guide that calls for the replacement of the outdated cash basis accounting, currently used by most urban local bodies, with a modified accrual system of accounting and financial reporting that will enhance financial planning and measurement of performance.	N/A	N/A
Not Applicable	*Not Applicable*	N	RUDO	**Urban Environmental Management Tool Kits – General**	Environmental mapping, environmental workbooks, environmental risk assessments, environment management action plans: instruments for broader, more informed participation leading to improved urban management and support for commercially-viable approaches. Last year, RUDO reported separately on "workbooks" and "risk assessments". Both activities continue successfully, both contribute strongly to	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					improving the information base, to enhancing participatory approaches to the identification, assessment, and use of important information, and both contribute powerfully to the implementation of India's 74th Constitutional Amendment devolving power and authority to lower levels of government and in general decentralization efforts in South Asian countries. Progress on environmental workbooks leads communities and their local governments to greater awareness of local problems and hazards, and to a recognition that only with improved information can they make good decisions about the prudent use of scarce resources.		

Bangladesh

Kulna		M	RUDO	**Environmental Mapping and Comperartive Health Risk Assessment**	In Bangladesh, RUDO support to USAID/Dhaka has evolved rapidly. RUDO has successfully initiated a number of activities on urban environmental management in participation with the Mission's Food Security Team, Environment Officers and Responsive Governance Team, local authorities and NGOs. Environmental mapping activities in two small towns of Mongla and Gopalganj have been completed. The report has been finalized after feedback was obtained from the stakeholders in the towns through Public Workshops. The BCAS has incorporated the feedback and comments obtained through Public Workshops into the final report. A Comparative Health Risk Assessment (CRA) was completed for Khulna City. The CRA got tremendous response from the Khulna Municipal Corporation (KMC) and other stakeholders in the city. At the request of KMC the next the next logical phase i.e. nvironmental Risk Management Action Plan was initiated and completed for the city. An interdisciplinary team lead by the Khulna University supported by RUDO, USAID/Dhaka and EHP/Washington successfully completed the Risk Management Action Plan for the city. The Khulna Municipal Corporation lead by the Mayor provided excellent leadership to the activity and the Public Workshop provided excellent forum to bring together all the stakeholders who commanded the effort and provided useful feedback on the draft Risk Management Action Plan, based on which the report has been finalized and adopted by the Khulna Municipal Corporation, and will be used for offering and negotiating infrastructure project proposals with other Donors. The Khulna University also completed Environmental Maps/Workbook for the Khulna City during the year, with support from RUDO. With RUDO support Waste Concern an NGO in Dhaka, has expanded its program of community based solid waste composting, enlisting support from the communities as well as Dhaka Municipal Corporation. Waste Concern has completed a study in Inventory of Land available with Dhaka Municipal Corporation and proposal for decentralized composting as a strategy for managing solid waste in Dhaka City. Waste Concern is also preparing training programs for city officials as well as other NGOs and is conducting training programs for other cities/NGOs on Composting and Resource Management. Waste Concern also hosted a two day Regional Seminar in Dhaka on 'Community Based Solid Waste Management' sponsored jointly by RUDO, UMP and	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					World-Bank Water & Sanitation Program for South Asia. http://www.makingcitieswork.org/southasia/envmapbang.html		
Kulna		M	RUDO	**Urban Environmental Management Tool Kits –**	Environmental Risk Assessment	N/A	N/A
Kulna		M	RUDO	**Urban Environmental Management Tool Kits –**	Risk Management Action Plan - This has helped the city identify and prioritize infrastructure projects to be presented for funding by the Government of Bangladesh and other donor agencies.	N/A	N/A
Mongla		M	RUDO		Environmental Mapping	N/A	N/A
Mongla		M	RUDO	**Urban Environmental Management Tool Kits –**	Environmental Risk Assessment	N/A	N/A
Gopalganj		M	RUDO	**Urban Environmental Management Tool Kits –**	Environmental Risk Assessment	N/A	N/A
Tongi, Gaibandha		M	ADPC	Bangladesh Urban Disaster Mitigation Project	The Bangladesh Urban Disaster Mitigation Project (BUDMP) under the USAID's Office of Foreign Disaster Assistance (OFDA) supported Asian Urban Disaster Mitigation Program (AUDMP) has been implemented by CARE Bangladesh to explore methods to reduce the vulnerability of urban populations to floods in two secondary cities in Bangladesh through flood mitigation measures. It includes non-structural or minor structural measures that could be undertaken by communities to mitigate the effects of floods. The specific BUDMP activities are determined by the various stakeholders (target communities, local government officials, municipalities, CARE, CARE's partner NGOs, etc.) based on a thorough needs assessment. The BUDMP commenced from March 2000. The project is implemented in two cities, namely, Tongi and Gaibandha, which are regularly affected by floods. The project aims at active participation of municipalities and local communities. http://www.adpc.ait.ac.th/audmp/bangla.html	N/A	N/A
Not Applicable	*Not Applicable*	N	ADPC	**Focus on the Poor: Long-Term Disaster Management in Bangladesh**	The Government of Bangladesh and the World Bank hosted an international conference entitled "Focus on the Poor: Long-Term Disaster Management in Bangladesh" on 20 -21 June 2000 in Dhaka, Bangladesh, with co-sponsorship from ADPC. Other co-sponsors include the Public-Private Partnership Infrastructure Advisory Group (PPIAF), the United Nations Development Programme (UNDP) and the World Conservation Union (IUCN). The conference will focus on community-based mechanisms for disaster	20 -21 June 2000	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
					mitigation and the role of the private sector, specifically microfinance institutions in providing such mitigation.		

Nepal

Multiple cities	*Not Applicable*	M	RUDO	**Development and Application of Urban Environmental Mapping**	Building on its successful work on environmental risk assessment and environmental mapping/workbook in India, Bangladesh and Sri Lanka, RUDO extended its support to Nepal where two newly formed municipalities were assisted to create much needed information base on the environmental status of the urban areas and which have allowed them to develop their capacity building plans and development agenda. Environmental Workbook: Madhyapur-Thimi Municipality - RUDO supported the municipality of Madhyapur-Thimi to complete an environmental mapping exercise for its urban and peri-urban areas during FY98. Environmental Workbook: Kirtipur Municipality - Based on the tremendous interest generated by the Madhyapur-Thimi workbook and based on specific request RUDO received from another new municipality, RUDO has extended its support in FY99 to the municipality of Kirtipur in the Kathmandu valley. The work is expected to be completed in June, 2000. Technical Assistance to KMC for implementing CAS - The primary objective of this TA is to build up the institutional capacity of the KMC and transform it into a dynamic agency that could respond to the emerging demands of city management based on increased people's participation. http://www.makingcitieswork.org/southasia/nepalmap.html	N/A	N/A

Sri Lanka

Multiple cities	*Not Applicable*	M	RUDO	**Promotion of Private Infrastructure Project**	Recognizing the need to adopt different strategies to deal with its growing infrastructure problems, the Government of Sri Lanka promotes a policy which encourages public-private partnerships for infrastructure development. USAID/Colombo strongly supports this new approach and has developed the Promotion of Private Infrastructure Project (PPI) to assist Sri Lanka in its efforts to modernize its infrastructure, to develop a market for private financing and management of infrastructure, and to increase the quality and competitiveness of infrastructure services. The Project will support private sector participation, through BOO and BOT operations, in the development of new infrastructure in the following sectors: 1.Power and Electricity; 2.Telecommunications; 3.Transportation; 4.Water; 5.Solid Waste. Most activities are centered around water, sanitation, and solid waste management. http://www.makingcitieswork.org/southasia/ppip.html	N/A	N/A
Kandy		M	RUDO	**Urban Environmental**	In November, 1999, technical assistance in the area of Solid Waste Management and Treatment was requested by the Kandy Municipal Council, Sri Lanka. Mr. Asnani visited	N/A	N/A

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
				Infrastructure Services (P.U. Asnani)	Kandy and made several field visits to assess the ground status of the city's SWM provision. Detailed discussions were held with the relevant Municipal Officials on current and proposed suggestions for improvement. The visit ended with a final discussion attended by Kandy, Ratnapura Municipal representatives, and ROMIN (local consultants). The EI report on improving the overall SWM services through private sector participation has been forwarded to the Mayor, Kandy Municipal Corporation, Sri Lanka.		
Ratnapura		M	ADPC	Sri Lanka Urban Multi-Hazard Mitigation Project (SLUMDMP)	Urbanizing areas in Sri Lanka are vulnerable to a number of hazards. The town of Ratnapura, an urban growth center, represents the risk due to landslides, frequent flooding, erosion, pollution and contamination of water supplies, subsidence, and other hazards. The objective of Ratnapura project is to reduce the vulnerability of such hazards. The project demonstrates a methodology for identifying hazards and for selecting appropriate strategies to avoid or reduce hazard related losses. The project assists municipal officials to develop improved tools and skills in development planning and risk management. Demonstration activity elements include hazard and vulnerability mapping, risk analysis, strategic planning, policy and procedural changes, training and professional development, and networking. The SLUMDMP has already completed the activities outlined under the demonstration phase of the project. The project is now preparing for the replication phase and soon after the replication phase if finalized the proposed activities will appear on this page. http://www.adpc.ait.ac.th/audmp/sri.html	N/A	N/A
Not Applicable	*Not Applicable*	N	ADPC	**Sri Lanka's National Course on Natural Disaster Mitigation (NDM-1/SLIDA)**	The course aims to enhance the capacity of national and sub-national institutions of the public sector that are involved in reducing and managing the risk from natural hazards, by introducing hazard mitigation techniques in strategic planning and administrative practices. This is an activity under ADPC's Asian Urban Disaster Mitigation Program (AUDMP). The training component of AUDMP aims to further institutionalize disaster mitigation practices, by using a "train the trainers" approach regionally and in-country for passing on technical skills and knowledge. Generic training curricula is developed on a range of mitigation strategies for different hazards in urban areas which are then adapted to suit local needs. At the national level, the training courses are offered by national partner training institutions (NPTIs). http://www.adpc.ait.ac.th/audmp/news/news.html#sricourse	27 Nov. to 2 Dec. 2000	N/A

Regional Activities

Not applicable	*Not applicable*	R	USAID	**South Asian Regional Initiative for Clean Energy (SARI/E)**	The recently authorized $50 million South Asian Regional Initiative for Clean Energy (SARI/E) to enhance energy cooperation among India, Bangladesh, and Nepal. This cooperation aims to reduce costs, increase efficiency and reliability of power supply, and reduce the growth rate of net greenhouse gas (GHG) emissions in the region.	2000-	Bob Beckman, Jim Bever; Del McKulsky (DC)

City	State	*	Office/ Agency	Activity Title	Activity Description	Dates	Partners/ Contacts
Not applicable	*Not applicable*	R	US-AEP	**International Workshop on Automotive Technology and Fuel Quality**	N/A	January 15-17, 2001	Indian Oil Corporation
Not applicable	*Not applicable*	M	ADPC	Asian Urban Disaster Mitigation Program (AUDMP)	The AUDMP, launched in 1995, is ADPC's largest regional program. The program, with its core funding from USAID/OFDA, currently works in eight countries of the region. The program was designed to make cities safer from disasters, with a goal of reducing the disaster vulnerability of urban populations, infrastructure, critical facilities and shelter in targeted cities in Asia, and to promote replication and adaptation of successful mitigation measures throughout the region. Towards this end, the program conducts national demonstration projects, information dissemination and networking activities, and policy seminars and professional training in the target countries of Bangladesh, Cambodia, China, India, Indonesia, Lao PDR, Nepal, Philippines, Sri Lanka, and Vietnam.	N/A	N/A
Not applicable	*Not applicable*	M	ADPC	Program for Understanding Extreme Climate Events (ECE)	The ECE Program is a follow-up initiative to the Asian Regional Meeting on El Nino Related Crises held by ADPC in collaboration with the National Oceanic and Atmospheric Administration (NOAA) and with support from United States Office of Foreign Disaster Assistance (OFDA) in February 1998. The goal of the program is to significantly improve the understanding of the impacts of extreme climate events such as El Nino and La Nina on society and the environment in selected Asian countries and to reduce the disaster impacts of such events through effective application of climate forecast information. The program, supported by OFDA, currently runs in Indonesia, Philippines and Vietnam and, in its next phase, is likely to be extended to Bangladesh and Thailand.	N/A	N/A

Annex C: Strategic Objectives and Results for RUDO/South Asia and Key USAID Missions and Programs (as of FY2001)

RUDO/South Asia (based on G/ENV strategic framework)

SO 2 – Improved Management of Urbanization in Targeted Areas

Result 2.1 - Expanded and Equitable Delivery of Urban Environmental Services and Shelter

Result 2.2 - More Effective Local Governments

2.2.1 Improved financial management by local governments to make management and investment decisions more effective and transparent

2.2.2 Improving local government institutional capacity to plan and deliver appropriate municipal services

2.2.3 Promoting transparency and reliability of intergovernmental transfers and revenue-sharing formulas for local public works

2.2.4 Enhancing local government accountability by increasing public awareness, understanding of participation in municipal budgetary planning, policy development, and delivery of urban services.

Result 2.3 - Reduced Urban Pollution (Although this result is now measured under G/ENV/EET, it remains a key component of USAID's global Urban Climate Change Strategy (1999).)

USAID Climate Change Initiative (CCI)

SpO1 - Agency Climate Change Program Effectively Implemented

Result 3 - Reduced Net Greenhouse Gas Emissions from the Energy Sector, Industry and Urban Areas

Result 4 - Reduced Vulnerability to the Threats Posed by Climate Change

USAID/India – Office of Environment, Energy, and Enterprise (E3)

SO 4 – Increased Environmental Protection in Energy, Industry, & Cities

Result 4.1 - Carbon dioxide equivalents of greenhouse gas (GHG) emissions avoided

Result 4.2 - Increased number of firms that meet international environmental quality standards in selected industrial sectors

Result 4.3 - Improved Urban Environmental Infrastructure Built and Services Delivered in Selected Cities

USAID/Bangladesh

SO 7 – Improved Performance of the Energy Sector

Result 7.1 – Increased Institutional Capacity to Make Decisions in Clean Energy Development

Result 7.2 – Improved Enabling Environment

Result 7.3 – Increased Public Support for Energy Sector Reform

USAID/Sri Lanka

Not applicable.

USAID/Nepal

Not applicable.

US-Asia Environmental Partnership (US-AEP) - India

Intermediate Result 1.1 – Strengthening of Environmental Laws and Regulations

Intermediate Result 1.2 – Improving Urban Environmental Management

Intermediate Result 1.3 – Improving Industrial Environmental Management

Intermediate Result 1.4 – Assisted Business Transactions Other than Direct Sales

Annex D: Current Activities of US-Asia Environmental Partnership (US-AEP) in South Asia relating to Urban Environment and Development

Urban Water

- Wastewater Technology Review
- USTDA Assistance to TNPCB for Wastewater Recycling
- Seminar on AIWPS Technology on Wastewater Treatment in India
- Defluorodization and Urban Groundwater Remediation
- Water and Wastewater Recycling and Reuse – Training Program for Operators of Common Effluent Treatment Plans and officials of Gujarat Industrial Development Corporation

Solid Waste Management

- Finalization of National Regulations on Solid Waste Management
- National Manual on Solid Waste Management
- Identification of Proven Technology (solid waste treatment and disposal)
- Improving Solid Waste Management by Addressing Gender Issues
- Improving Solid Waste Management Practices
- Improved Management of Solid Waste by Local Governments – Urban Management and Finance, Outreach

Clean Air

- Workshop on Air Pollution Control
- Mobile Air Emissions – Demonstration of Cleaner Combustion Technology/Retrofitment in Existing Diesel IC Engine
- Mobile Air Emissions – Emissions Testing Technologies
- Establishment of ECO-India Project (vehicle inspection and maintenance)
- Delhi Particulate Matter Source Attribution Assessment and Monitoring Support
- Green Fleets Program (Delhi or other location TBD)
- Vehicular Air Pollution Control Equipment – Technology Screening Session
- Vehicular Air Pollution Control Equipment – Environment Technology Fund
- International Workshop on Automotive Technologies and Fuel Quality for Environmental Protection

Green Buildings

- Green Housing/ Hospitality Program

Urban Program Activities

- Establishment of Professional Body of City Managers in Four States in India
- Support of City Managers Associations – Urban Management and Finance
- Community Participation Initiative – NGO Capacity Building
- Urban Impact on GCC – Policy, Management, and Environmental Quality
- Technology Identification and Review – Urban Services and Environmental Quality

Environmental Management Capacity Building

- Revival of USEPA Assistance to Southern Region Pollution Control Boards (Tamil Nadu)
- IA Establishing CETPs in New Delhi
- Capacity Building of Eastern India Multiplier Agencies
- Environment Awareness Program in Bangladesh

Industries

- Industrial Estates and Relocation of Industries